Enterasys® SecureStack™ C2

Gigabit Ethernet Switches

Hardware Installation Guide

C2G124-48P
C2H124-48P

enterasys®

Electrical Hazard: Only qualified personnel should perform installation procedures.

Riesgo Electrico: Solamente personal calificado debe realizar procedimientos de instalacion.

Elektrischer Gefahrenhinweis: Installationen sollten nur durch ausgebildetes und qualifiziertes Personal vorgenommen werden.

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This product complies with the following: 47 CFR Parts 2 and 15, CSA C108.8, 89/336/EEC, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024, AS/NZS CISPR 22, VCCI V-3.

COMPATIBILIDAD ELECTROMÁGNETICA (EMC)

Este producto de Enterasys cumple con lo siguiente: 47 CFR Partes 2 y 15, CSA C108.8, 89/336/EEC, EN 55022, EN 55024, EN 61000-3-2, EN 61000-3-3, AS/NZS CISPR 22, VCCI V-3.

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In accordance with Directive 2002/96/EC of the European Parliament on waste electrical and electronic equipment (WEEE):

1. The symbol above indicates that separate collection of electrical and electronic equipment is required and that this product was placed on the European market after August 13, 2005, the date of enforcement for Directive 2002/96/EC.

2. When this product has reached the end of its serviceable life, it cannot be disposed of as unsorted municipal waste. It must be collected and treated separately.

3. It has been determined by the European Parliament that there are potential negative effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment.

4. It is the users' responsibility to utilize the available collection system to ensure WEEE is properly treated.

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Supplement to Product Instructions

部件名称 (Parts)	有毒有害物质或元素 (Hazardous Substance)					
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金属部件 (Metal Parts)	✕	○	○	○	○	○
电路模块 (Circuit Modules)	✕	○	○	○	○	○
电缆及电缆组件 (Cables & Cable Assemblies)	✕	○	○	○	○	○
塑料和聚合物部件 (Plastic and Polymeric parts)	○	○	○	○	○	○
电路开关 (Circuit Breakers)	○	○	○	○	○	○

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- 21 CFR 1040.10 and 1040.11 U.S. Department of Health and Human Services (FDA).

- IEC Publication 825 (International Electrotechnical Commission).

- CENELEC EN 60825 (European Committee for Electrotechnical Standardization).

When operating within their performance limitations, laser transceiver output meets the Class 1 accessible emission limit of all three standards. Class 1 levels of laser radiation are not considered hazardous.

When the connector is in place, all laser radiation remains within the fiber. The maximum amount of radiant power exiting the fiber (under normal conditions) is -12.6 dBm or 55×10^{-6} watts.

Removing the optical connector from the transceiver allows laser radiation to emit directly from the optical port. The maximum radiance from the optical port (under worst case conditions) is 0.8 W cm^{-2} or 8×10^3 W m^2 sr-1.

Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.

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Application of Council Directive(s):	**89/336/EEC** **73/23/EEC**
Manufacturer's Name:	**Enterasys Networks, Inc.**
Manufacturer's Address:	**50 Minuteman Road** **Andover, MA 01810** **USA**
European Representative Address:	**Enterasys Networks, Ltd.** **Nexus House, Newbury Business Park** **London Road, Newbury** **Berkshire RG14 2PZ, England**
Conformance to Directive(s)/Product Standards:	**EC Directive 89/336/EEC** **EN 55022** **EN 61000-3-2** **EN 61000-3-3** **EN 55024** **EC Directive 73/23/EEC** **EN 60950** **EN 60825**
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11.   **ASSIGNMENT.**   You may not assign, transfer or sublicense this Agreement or any of Your rights or obligations under this Agreement, except that You may assign this Agreement to any person or entity which acquires substantially all of Your stock or assets. Enterasys may assign this Agreement in its sole discretion. This Agreement shall be binding upon and inure to the benefit of the parties, their legal representatives, permitted transferees, successors and assigns as permitted by this Agreement. Any attempted assignment, transfer or sublicense in violation of the terms of this Agreement shall be void and a breach of this Agreement.

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About This Guide

This guide provides an overview, installation and troubleshooting instructions, and specifications for the Enterasys® SecureStack C2G124-48P and C2H124-48P stackable Gigabit Ethernet switches.

For information about the Command Line Interface (CLI) set of commands used to configure and manage the C2G124-48P or C2H124-48P, refer to the Enterasys Networks® *SecureStack C2 Configuration Guide*.

This preface provides an overview of this guide and the SecureStack C2 manual set, and explains the symbols used throughout this guide.

> **Note:** In this guide, the following terms are used:
>
> - *Switch* refers to both C2G124-48P and C2H124-48P, unless otherwise noted.
> - *MGBIC* (Mini-Gigabit Interface Card) refers to optional small form pluggable (SFP) interface modules that plug into the fixed front panel MGBIC slots.

Important Notice

Depending on the firmware version used in the switch, some features described in this document may not be supported. Refer to the Release Notes shipped with the switch to determine which features are supported.

Who Should Use This Guide

This guide is intended for a network administrator responsible for installing and setting up the stackable switches.

> **Electrical Hazard:** Only qualified personnel should perform installation procedures.
>
> **Riesgo Electrico:** Solamente personal calificado debe realizar procedimientos de instalacion.
>
> **Elektrischer Gefahrenhinweis:** Installationen sollten nur durch ausgebildetes und qualifiziertes Personal vorgenommen werden.

How to Use This Guide

Read through this guide completely to familiarize yourself with its contents and gain an understanding of the features and capabilities of the stackable Ethernet switch. A general knowledge of data communications networks is helpful when setting up the switch.

This guide provides the information about the following:

For...	Refer to...
An overview of the switch features and how to obtain technical support	Chapter 1, **Introduction**
Network requirements that must be met before installing the switch	Chapter 2, **Network Requirements**
Instructions to install the switch on a flat surface or in a standard 19-inch rack, and configure the switch in a stacked configuration. A description of Power over Ethernet (PoE) is also provided.	Chapter 3, **Hardware Installation**
Troubleshooting installation problems and diagnosing network/operational problems using the LANVIEW LEDs	Chapter 4, **Troubleshooting**
Specifications, environmental requirements, and physical properties of the switch and optional Mini-GBICs	Appendix A, **Specifications**

Related Documents

The following documents can help you to set up and manage the switch:

SecureStack C2 Configuration Guide

Cabling Guide

The manuals listed above can be obtained from the World Wide Web in Adobe Acrobat Portable Document Format (PDF) at the following site:

http://www.enterasys.com/support/manuals

Unlike the *SecureStack C2 Configuration Guide*, click on *Overview Guides* at the manuals web site to find the *Cabling Guide*.

Conventions Used in This Guide

The following conventions are used in this guide:

Note: Calls the reader's attention to any item of information that may be of special importance.

Caution: Contains information essential to avoid damage to the equipment.

Cautela: Contiene información esencial para prevenir dañar el equipo.

Achtung: Verweißt auf wichtige Informationen zum Schutz gegen Beschädigungen.

Electrical Hazard: Warns against an action that could result in personal injury or death due to an electrical hazard.

Riesgo Electrico: Advierte contra una acción que pudiera resultar en lesión corporal o la muerte debido a un riesgo eléctrico.

Elektrischer Gefahrenhinweis: Warnung vor sämtlichen Handlungen, die zu Verletzung von Personen oder Todesfällen – hervorgerufen durch elektrische Spannung – führen können!

Warning: Warns against an action that could result in personal injury or death.

Advertencia: Advierte contra una acción que pudiera resultar en lesión corporal o la muerte.

Warnhinweis: Warnung vor Handlungen, die zu Verletzung von Personen oder gar Todesfällen führen können!

1

Introduction

This chapter introduces the C2G124-48P and C2H124-48P Gigabit Ethernet stackable switches.

Important Notice

Depending on the firmware version used in the switch, some features described in this document may not be supported. Refer to the Release Notes shipped with the switch to determine which features are supported.

Overview

The C2G124-48P and C2H124-48P are stackable switches that can be adapted and scaled to help meet your network requirements. These switches provide a management platform and an uplink to a network backbone for a stacked group of up to eight C2 switches.

The switches also support the use of a redundant DC power supply to help prevent downtime due to an internal power supply failure in the switch or AC power source.

You can install the switch on a flat surface or into a standard 19-inch rack with user-supplied mounting hardware, and configure the switch functions using the WebView™ application, CLI switching commands, and/or SNMP.

C2G124-48P Stackable Switch

The C2G124-48P (Figure 1-1) has several types of front panel port connections, which include:

- Forty-eight RJ45 ports (10/100/1000 Mbps, 1000BASE-T copper ports) that also support PoE for connections to network 803.2af compliant PDs (powered devices).

- SFP slots that provide you with the option of installing Small Form Pluggable (SFP) Mini-GBICs for 1000BASE-T compliant copper connections or 1000BASE-SX/LX fiber-optic connections.

> **Note:** The Mini-GBIC ports cannot be active simultaneously with their corresponding 10/100/1000BASE-T ports. For example, if SFP port 48 establishes a link first on the C2G124-48P, the 10/100/1000BASE-T built-in RJ45 port 48 is not available and vice-versa.

- Rear panel connectors for high-speed connections in a stack configuration.

- Rear panel Redundant Power Supply connector used to connect to a SecureStack C2 PoE Redundant Power Supply (C2RPS-POE). The switch connects to the C2RPS-POE using a C2RPS-POE Cable.

> **Caution:** The C2G124-48P **is a** PoE-compliant device. **Do not** connect a SecureStack C2 Redundant Power System (C2RPS-SYS) to the power connector. Otherwise, damage to the device may result.
>
> **Precaución:** El dispositivo C2G124-48P **cumple** con el estándar PoE. **No conecte** una fuente de poder redundante SecureStack C2 (C2RPS-SYS) al cable de corriente directa. De lo contrario, el dispositivo puede dañarse.

The 10/100/1000 Mbps fixed front panel ports can operate in either half-duplex or full-duplex mode, as determined by Auto-Negotiation.

Figure 1-1   C2G124-48P Stackable Switch
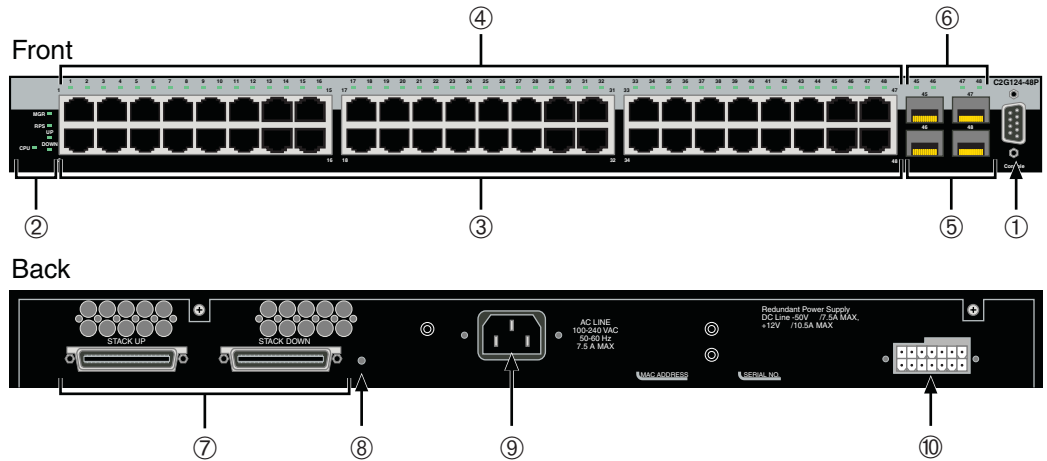
1 DB9 RS232 console port connector	**6** Mini-GBIC port status LEDs
2 System Status LEDs	**7** Two ports for stack connections
3 Twenty-four RJ45, 10/100/1000 Mbps, PoE ports	**8** Password Reset switch
4 RJ45 port status LEDs	**9** AC power input connector
5 Four slots for SFP interface modules (Mini-GBICs)	**10** Redundant power supply (RPS) DC connector

C2H124-48P Stackable Switch

The C2H124-48P (Figure 1-1) has several types of front panel port connections, which include:

- Forty-eight RJ45 ports (10/100 Mbps, 10BASE-T/100BASE-TX copper ports) that also support PoE for connections to network 803.2af compliant PDs (powered devices).

- SFP slots that provide you with the option of installing Small Form Pluggable (SFP) Mini-GBICs for 1000BASE-T compliant copper connections or 1000BASE-SX/LX fiber-optic connections.

> **Note:** Unlike the C2G124-48P, all built-in RJ45 front panel ports and SFP ports can be linked and active at the same time.

- Rear panel connectors for high-speed connections in a stack configuration.

- Rear panel Redundant Power Supply connector used to connect to a SecureStack C2 PoE Redundant Power Supply (C2RPS-POE). The switch connects to the C2RPS-POE using a C2RPS-POE Cable.
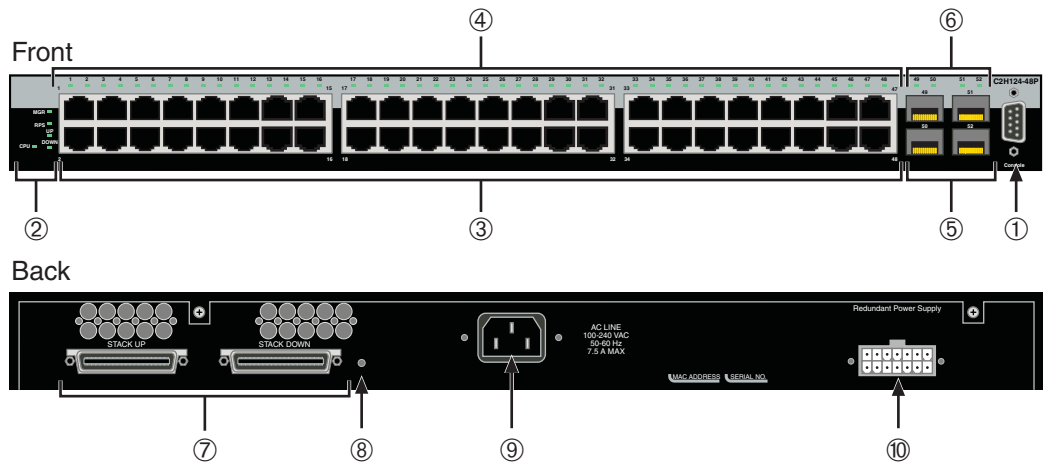
⚠ **Caution:** The C2G124-48P **is a** PoE-compliant device. **Do not** connect a SecureStack C2 Redundant Power System (C2RPS-SYS) to the power connector. Otherwise, damage to the device may result.

Precaución: El dispositivo C2G124-48P **cumple** con el estándar PoE. **No conecte** una fuente de poder redundante SecureStack C2 (C2RPS-SYS) al cable de corriente directa. De lo contrario, el dispositivo puede dañarse.

The 10/100 Mbps fixed front panel ports can operate in either half-duplex or full-duplex mode, as determined by Auto-Negotiation.

Figure 1-2   C2H124-48P Stackable Switch

1	DB9 RS232 console port connector	**6**	Mini-GBIC port status LEDs
2	System Status LEDs	**7**	Two ports for stack connections
3	Twenty-four RJ45, 10/100 Mbps, PoE ports	**8**	Password Reset switch
4	RJ45 port status LEDs	**9**	AC power input connector
5	Four slots for SFP interface modules (Mini-GBICs)	**10**	Redundant power supply (RPS) DC connector

High-Speed Stack Connections

The switch has rear-panel connectors for high-speed connections in a stack configuration. The high-speed stacking cables used for the connections are optional items and must be ordered separately. There are two types of cables:

- a C2CAB-SHORT cable to connect two adjacent switches in the stack, and

- a C2CAB-LONG cable to connect from the top switch to the bottom switch in the stack. You need only one C2CAB-LONG cable per stack.

Redundant Power Supply Capability

The switch has power supply redundancy capability when connected to an optional external redundant power supply (RPS). If the internal power supply fails, the RPS assumes the entire load of the switch without interrupting network traffic. The internal power supply and RPS each have their own AC power connection, which enables the connection of each power supply to a different AC power circuit for additional AC power source redundancy.

PoE (Power over Ethernet) Support

The switch is 802.3af compliant, which means it can provide power over Ethernet cable connections from its 48, RJ45 front panel connectors to PDs in the network.

Power over Ethernet (PoE) refers to the ability to provide 48 Vdc power to a powered device using the same Ethernet cabling that provides data. Modern Ethernet implementations employ differential signals over twisted pair cables. This requires a minimum of two twisted pairs for a single physical link. Both ends of the cable are isolated with transformers blocking any DC or common mode voltage on the signal pair. PoE exploits this fact by using two twisted pairs as the two conductors to supply a direct current. One pair carries the power supply current and the other pair provides a path for the return current. While several proprietary legacy implementations of PoE have been deployed by LAN equipment vendors, in 2003 the IEEE published the IEEE 802.3af-2003 specification, which is part of the 802.3 suite of standards.

The switch is fully compliant with the IEEE 802.3af standard. It supports the standard resistor based detection method, as well as AC disconnect capability. The switch is also capable of supplying 7.5 Watts of power to all ports simultaneously.

Each PD (Powered Device) has a PDC (Powered Device Classification) that is transmitted to the switch for power management purposes. Table 1-1 on page 1-5 lists the classifications and the associated power ranges.

Table 1-1   Powered Device Classifications

Class	Usage	PD Maximum Power Range Usage
0	Default	0.44 to 12.95 Watts
1	Optional	0.44 to 3.84 Watts
2	Optional	3.84 to 6.49 Watts
3	Optional	6.49 to 12.95 Watts
4	Not Allowed	Reserved for Future Use

Connectivity

The switch connects to Ethernet networks or workstations through the fixed front panel RJ45 connectors and four uplink ports that support optional Mini-GBICs.

At the time of this printing, the six Mini-GBICs available from Enterasys are described in Table 1-2 on page 1-6. These Mini-GBICs meet or exceed the IEEE 802.3z-1998 standard.

Table 1-2   Description of Mini-GBICs

Mini-GBIC	Specification
MGBIC-LC01	Provides one 1000BASE-SX compliant LC fiber-optic multimode port and a standard LC connector. For optical and operating range specifications, refer to "MGBIC-LC01/MGBIC-MT01 Specifications (1000BASE-SX)" on page A-4.
MGBIC-LC03	Provides one 1000BASE-LX compliant LC fiber-optic multimode port with a standard LC duplex connector. For optical and operating range specifications, refer to "MGBIC-LC03 Specifications (1000BASE-LX)" on page A-4.
MGBIC-LC09	Provides one 1000BASE-LX compliant LC fiber-optic single-mode port with a standard LC connector. For optical and operating range specifications, refer to "MGBIC-LC09 Specifications (1000BASE-LX)" on page A-5.
MGBIC-MT01	Provides one 1000BASE-SX compliant LC fiber-optic multimode port with a standard MT-RJ connector. For optical and operating range specifications, refer to "MGBIC-LC01/MGBIC-MT01 Specifications (1000BASE-SX)" on page A-4.
MGBIC-08	Provides one 1000BASE-ELX compliant LC fiber-optic single-mode port with a standard LC connector. For optical and operating range specifications, refer to "MGBIC-08 Specifications (1000BASE-ELX)" on page A-6.
MGBIC-02	Provides one 1000BASE-T compliant copper port with an RJ45 connector. For details, refer to "MGBIC-02 Specifications (1000BASE-T)" on page A-6.

Management

Management of the module can be either in-band or out-of-band. In-band remote management is possible using Telnet, Enterasys Networks' NetSight® management application, or the WebView application. Out-of-band management is provided through the RJ45 COM (Communication) port on the front panel using a VT100 terminal or a VT100 terminal emulator.

Switch Configuration Using WebView

Enterasys Networks' HTTP-based Web management application (WebView) is an intuitive web tool for simple management tasks.

Switch Configuration Using CLI Commands

The CLI commands enable you to perform more complete switch configuration management tasks.

For CLI command set information and how to configure the module, refer to the *SecureStack C2 Configuration Guide*.

Standards Compatibility

The switches are fully compliant with the IEEE 802.3-2002, 802.3ae-2002, 802.3af-2002, 802.1D-1998, and 802.1Q-1998 standards. The switches provide IEEE 802.1D-1998 Spanning Tree Algorithm (STA) support to enhance the overall reliability of the network and protect against "loop" conditions.

LANVIEW Diagnostic LEDs

LANVIEW diagnostic LEDs serve as an important troubleshooting aid by providing an easy way to observe the status of individual ports and overall network operations.

Getting Help

For additional support related to the module or this document, contact Enterasys Networks using one of the following methods:

World Wide Web	http://www.enterasys.com/services/support
Phone	1-800-872-8440 (toll-free in U.S. and Canada)
	For the Enterasys Networks Support toll-free number in your country:
	www.enterasys.com/services/support/contact/
Internet mail	support@enterasys.com
	To expedite your message, please type **[SWITCHING]** in the subject line.

To send comments or suggestions concerning this document to the Technical Publications Department:

techpubs@enterasys.com

To expedite your message, please include the document Part Number in the email message.

Before contacting Enterasys Networks for technical support, have the following information ready:

• Your Enterasys Networks service contract number

• A description of the failure

- A description of any action(s) already taken to resolve the problem (for example, changing mode switches, rebooting the unit, and so forth)

- The serial and revision numbers of all involved Enterasys Networks products in the network

- A description of your network environment (such as layout, cable type, and so forth)

- Network load and frame size at the time of trouble (if known)

- The device history (for example, have you returned the device before, is this a recurring problem, and so forth)

- Any previous Return Material Authorization (RMA) numbers

2

Network Requirements

Before installing the device, review the requirements and specifications in this chapter concerning the following:

> **Note:** All RJ45 connectors support PoE connections from network PDs (Powered Devices).

For information about...	Refer to page...
10BASE-TX Network	2-2
100BASE-TX Network	2-2
1000BASE-FX Network	2-2
1000BASE-T Network	2-3

> **Note:** The network installation must meet the requirements described in this chapter to ensure satisfactory performance of this equipment. Failure to do so will produce poor network performance.

> **Note:** The *SecureStack C2 Configuration Guide* and the *Cabling Guide* referred to in the following sections can be found on the Enterasys Networks World Wide Web site: **http://www.enterasys.com/support/manuals**
>
> For details about obtaining the manuals, refer to "Related Documents" on page xvi.

10BASE-TX Network

When connecting a 10BASE-TX segment to one of the RJ45 fixed ports (1 through 48) on both the C2G124-48P and the C2H124-48P, ensure that the network meets the Ethernet network requirements of the IEEE 802.3-2002 standard for 10BASE-TX. Refer to the *Cabling Guide* for details.

Note: If a port is to operate at 100 or 1000 Mbps, Category 5 cabling must be used. Category 3 cabling does not meet the 100 or 1000 Mbps specifications. For 10 Mbps operation only, Category 3, Category 4, or Category 5 cabling can be used. Refer to 100BASE-TX Network (page 2-2) and 1000BASE-T Network (page 2-3) for information about 100BASE-TX and 1000BASE-T networks and cabling.

100BASE-TX Network

When connecting a 100BASE-TX segment to one of the RJ45 fixed ports (1 through 48) on both the C2G124-48P and the C2H124-48P, use Category 5 UTP cabling. The switch at the other end of the twisted pair segment must meet IEEE 802.3-2002 100BASE-TX Fast Ethernet network requirements for the switches to operate at 100 Mbps.

Note: When using the fixed ports on the switch for 100 Mbps operation use Category 5 UTP cabling with an impedance between 85 and 111 ohms for 100 Mbps operation.

The fixed switch ports are capable of operating at 10, 100 or 1000 Mbps. This is accomplished by the switch when Auto-Negotiation is enabled. This enables the switch to automatically sense the transmission speed of the other device and adjust for the speed accordingly.

1000BASE-FX Network

The Mini-GBIC port sockets on the C2G124-48P and C2H124-48P enable you to vary the type of 1-Gbps port connection. The device at the other end segment must meet the same Gigabit Ethernet requirements for the connected devices to operate at 1-Gigabit speed. At the printing of this document there were five Mini-GBICs available that support fiber-optic connections, as listed below, and one that supports a copper connection as described in "1000BASE-T Network" on page 2-3:

- MGBIC-LC01 for a 1000BASE-SX compliant LC fiber-optic multimode connection

- MGBIC-LC03 for a 1000BASE-SX standard LC duplex style connector multimode connection

- MGBIC-LC09 for a 1000BASE-LX compliant LC fiber-optic single-mode connection

- MGBIC-MT01 for a 1000BASE-SX compliant MT-RJ fiber-optic single-mode connection

- MGBIC-08 for a 1000BASE-ELX compliant LC fiber-optic single-mode connection

1000BASE-T Network

The C2G124-48P, RJ45 fixed front panel connectors support RJ45 copper 1000BASE-T compliant connections. The Mini-GBIC port sockets on the C2G124-48P and C2H124-48P support optional SFP MGBIC-02 for RJ45 copper 1000BASE-T connections. When connecting a 1000BASE-T segment to one of the RJ45 fixed ports or to an optional MGBIC-02, use Category 5 UTP cabling. The device at the other end of the twisted pair segment must meet IEEE 802.3-2002 1000BASE-T Gigabit Ethernet network requirements for the devices to operate at 1000 Mbps.

3

Hardware Installation

⚠️ **Electrical Hazard:** Only qualified personnel should perform installation procedures.

Riesgo Electrico: Solamente personal calificado debe realizar procedimientos de instalacion.

Elektrischer Gefahrenhinweis: Installationen sollten nur durch ausgebildetes und qualifiziertes Personal vorgenommen werden.

Important Notice

Read the Release Notes shipped with the switch to check for any exceptions to the supported features and operation documented in this guide.

This chapter provides the instructions to install the C2G124-48P or C2H124-48P. Unless otherwise noted, the instructions apply to both switches. Follow the order of the sections listed below to correctly install the switches.

Considerations Prior to Installation

When installing the switch, note the following:

- Before starting the installation procedure, notify the network administrator of the installation.
- Follow the installation procedures in the order as presented in this guide.
- Do not connect the switch to the network until you have established the correct IP address.

Required Tools

A Phillips screwdriver is required to install the switch into a rack.

Unpacking the Switch

Unpack the switch as follows:

1. Open the box and remove the packing material protecting the switch.
2. Verify that the contents of the carton contains the items listed in Table 3-1.

Table 3-1   Contents of Switch Carton

Item	Quantity
Switch device	1
Rack mounting bracket	2
M3x6-mm flathead screws	8
Rubber feet with adhesive backing for installation on a flat surface	4
AC power cord (The type of power cord is country dependent.)	1
This installation guide	1
Customer Release Notes	1
URL notice card	1

3. Remove the tape seal on the non-conductive bag to remove the switch.
4. Perform a visual inspection of the switch for any signs of physical damage. Contact Enterasys Networks if there are any signs of damage. Refer to "Getting Help" on page 1-7 for details.

Installing Optional Mini-GBICs

This section describes how to install Mini-GBICs in any of the SFP port slots (45 through 48 of C2G124-48P, or 49 through 52 of C2H124-48P. It is recommended that the options be installed first in a new installation.

> ⚠️ **Warning:** Do not use optical instruments to view laser output. The use of optical instruments to view laser output increases eye hazard.
>
> **Advertencia:** No utilizar instrumentos opticos para ver el laser. El uso de instrumentos opticos para ver el laser incrementa el riesgo de perdida de la vision.
>
> **Warnhinweis:** Benutzen sie keinesfalls optische Hilfmittel, um die Funktion des Lasers zu überprüfen, es könnte ihr Augenlicht gefährden.

> ⚠️ **Caution:** Carefully follow the instructions in this manual to avoid damaging the Mini-GBIC and switch.
>
> The Mini-GBIC and switch are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could result in damage to the Mini-GBIC and switch. Always leave the Mini-GBIC in the antistatic bag or an equivalent antistatic container when not installed.
>
> **Precaución:** Siga las instrucciones del manual para no dañar el Mini-GBIC ni del aparato, puesto que son muy sensible a las descargas de electricidad estática. Utilice la pulsera antiestática y tome todas las precauciones necesarias durante este procedimiento. Si no lo hace, podría dañar el Mini-GBIC o del aparato. Mientras no esté instalado, mantenga el Mini-GBIC en su bolsa antiestática o en cualquier otro recipiente antiestático.

Preparing to Install a Mini-GBIC

Before installing the Mini-GBIC, proceed as follows:

1. Before removing the Mini-GBIC from the antistatic packaging, it is recommended that you use an antistatic wrist strap (not supplied) to prevent damage from static discharge. To use the wrist strap, refer to the instructions provided with your antistatic wrist strap.

2. Remove the Mini-GBIC from its packaging.

3. If there is a protective dust cover (see **5** in Figure 3-1 or Figure 3-2) in the Mini-GBIC connector, do not remove it at this time.

Installing a Mini-GBIC

To install a Mini-GBIC that has an MT-RJ connector, refer to Figure 3-1, or for a Mini-GBIC with an LC connector, refer to Figure 3-2, and proceed as follows:

> 📋 **Note:** If the Mini-GBIC is one with an RJ45 connector (not shown), the installation procedure is the same as described below. However, the Mini-GBIC has a wire handle to release it.

1. Hold the Mini-GBIC with the top side positioned as shown, and the 7-pin edge connector facing the port slot.

2. Carefully align the Mini-GBIC with the port slot.

3. Push the Mini-GBIC into the port slot until the Mini-GBIC "clicks" and locks into place.

Figure 3-1   Mini-GBIC with MT-RJ Connector
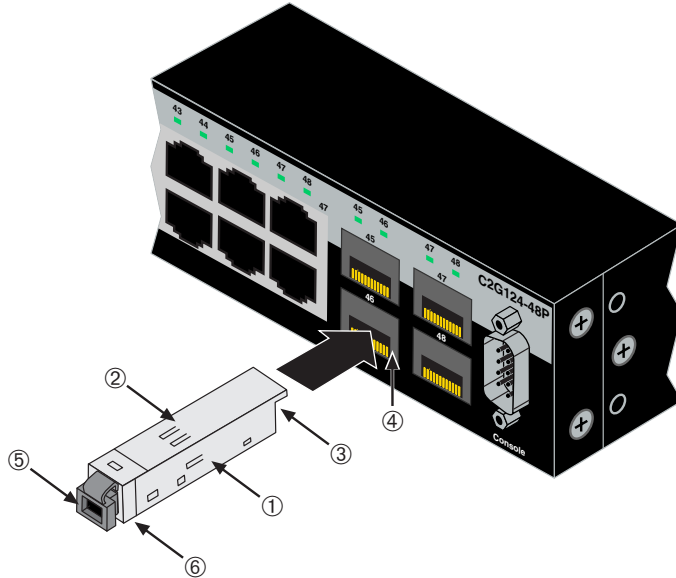
1	Mini-GBIC (MGBIC-MT01)	**4**	Port slot
2	Mini-GBIC, top side	**5**	Protective dust cover
3	7-pin edge connector (insertion side)	**6**	Release tab

Figure 3-2   Mini-GBIC with LC Connector
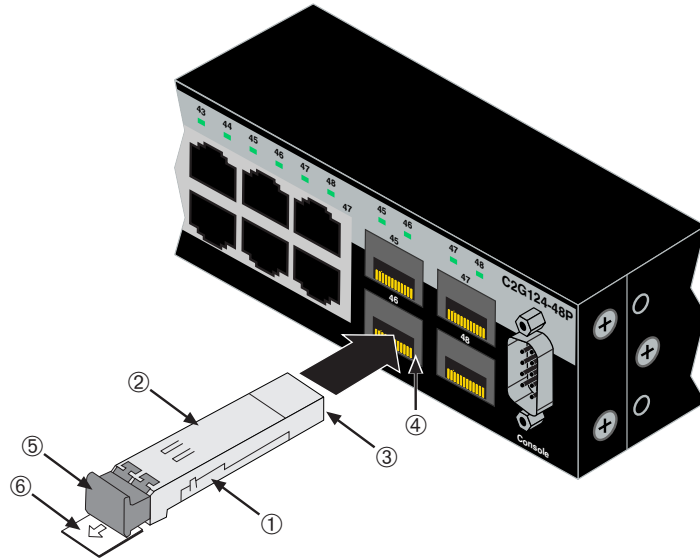
1 Mini-GBIC (MGBIC-LC01, -LC03, or -LC09) **4** Port slot
2 Mini-GBIC, top side **5** Protective dust cover
3 7-pin edge connector (insertion side) **6** Release tab

Removing a Mini-GBIC

⚠️ **Caution:** Do NOT remove a Mini-GBIC from a slot without releasing the locking tab located under the front bottom end of the Mini-GBIC. This can damage the Mini-GBIC. This is also true of the RJ45 Mini-GBICs with a wire handle. The handle must be pulled down toward the bottom of the Mini-GBIC to release it.

The Mini-GBIC and its host switch are sensitive to static discharges. Use an antistatic wrist strap and observe all static precautions during this procedure. Failure to do so could result in damaging the Mini-GBIC or host switch. Always leave the Mini-GBIC in the antistatic bag or an equivalent antistatic container when not installed.

Precaución: NO quite el Mini- GBIC de la ranura sin antes abrir la traba ubicada en la parte frontal del Mini- GBIC. Si lo hace, puede dañar el Mini- GBIC, puesto que es muy sensible a las descargas de electricidad estática, al igual que el dispositivo host. Utilice la pulsera antiestática y tome todas las precauciones necesarias durante este procedimiento. Si no lo hace, pude dañar el Mini- GBIC o el dispositivo host. Mientras no esté instalado, mantenga el Mini- GBIC en su bolsa antiestática o en cualquier otro recipiente antiestático.

To remove a Mini-GBIC from a port slot, refer back to Figure 3-1 and Figure 3-2, and proceed as follows:

1. Attach your antistatic wrist strap (refer to the instructions in your antistatic wrist strap package) before removing the Mini-GBIC.

2. Remove the cables connected to the Mini-GBIC.

3. Locate the release tab under the front end of the Mini-GBIC. For the type of Mini-GBIC shown in Figure 3-1, push in on the release tab as far as it will go to release the Mini-GBIC from the port slot. For the type of Mini-GBIC shown in Figure 3-2, pull out on the release tab to release the Mini-GBIC from the port slot.

4. Grasp the sides of the Mini-GBIC and pull it straight out of the port slot.

If you are storing or shipping a Mini-GBIC, which has a fiber-optic connector, insert its protective dust cover to protect the ends of the fiber-optic fibers from dust and contamination.

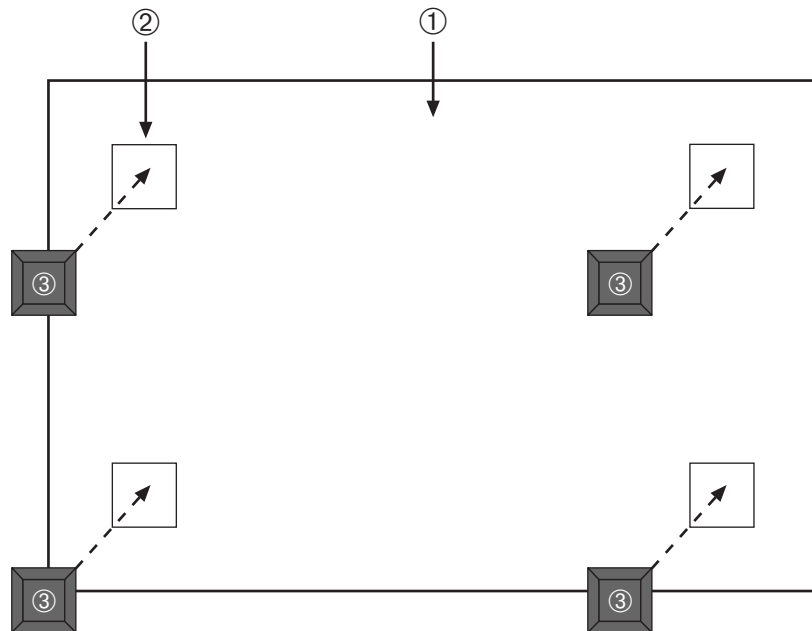# Installing the Switch on a Flat Surface

When installing the switch on a flat surface, the installation of the rubber feet is recommended to prevent the switch from sliding on a flat surface. Installing the rubber feet is optional if you are installing the switch in a rack. To install the rubber feet, proceed to "Installing the Rubber Feet" instructions below. For instructions to rack mount the switch, proceed to "Rack Mounting the Switch" on page 3-9.

Installing the Rubber Feet

To install the rubber feet, refer to Figure 3-3 and proceed as follows:

1. Place the switch on its back on a sturdy flat surface to gain access to the bottom of the chassis.

2. Remove the four rubber feet from their plastic bag in the shipping box.

3. Locate the four marked locations on the bottom four corners of the chassis.

Figure 3-3   Chassis Bottom, Rubber Feet Placement

1 Bottom of chassis as seen when chassis is resting on   **3** Rubber feet with adhesive backing
    its back   (four)
2 Locations to install the rubber feet (four locations)

4. Remove the protective strip from the back of one rubber foot and position it on a marked location and press firmly into place. Repeat this procedure to install the remaining three rubber feet.

5. After installing the rubber feet, return the switch to its upright position.

> **Note:** If a number of switches are being installed in a stack, repeat steps 1 through 4 to install the rubber feet on each switch before continuing with the installation.

6. To install switches on a flat surface proceed to "Guidelines for Flat Surface Installation" on page 3-8. For a rackmount installation, proceed to "Rack Mounting the Switch" on page 3-9.

Guidelines for Flat Surface Installation

Locate the switch within 152 cm (5 ft) of its power source and on a surface as shown in Figure 3-4. If an optional redundant power system is going to be installed and connected to the 14-pin Redundant Power Supply input connector on the rear of the switch, refer to the installation guide shipped with the redundant power system.

⚠️ **Caution:** To ensure proper ventilation and prevent overheating, leave a minimum clearance space of 5.1 cm (2.0 in.) at the left, right, and rear of the switch.

Do not connect the switch to the AC power source until instructed to do so later in the installation process.

Precaución: Para asegurar una buena ventilación y evitar que el sistema sesobrecaliente, deje un espacio mínimo de 5.1 cm (2 pulgadas) con respecto a los lados y a la parte posterior del aparato.

If you are installing several switches in a stack, proceed to "Connecting High-Speed Stacking Cables" on page 3-10. If the switch is being installed as a standalone switch, proceed to "Connecting AC and PoE Power" on page 3-15 for power connection instructions.

Figure 3-4   Area Guidelines for Switch Installation on Flat Surface
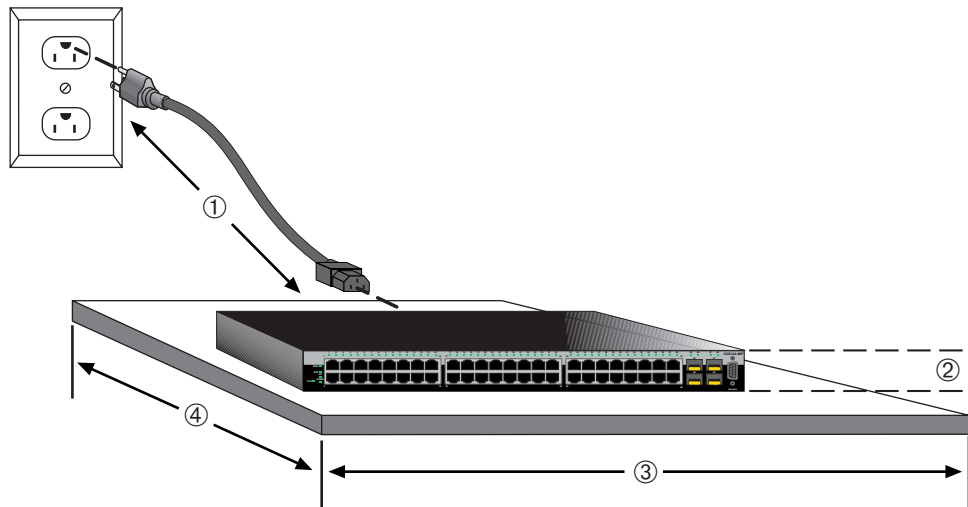
1	Approximately 152 cm (5 ft) from power source	**3**	44.5 cm (19.4 in.) for proper ventilation
2	4.45 cm (1.75 in.) per switch. (Vertical clearance depends on number of switches stacked.)	**4**	41.9 cm (16.5 in.) for proper ventilation

Rack Mounting the Switch

To install the switch in a 19-inch rack, you need:

- Two rackmount brackets and mounting screws shipped with the switch.

- Four user-supplied screws to attach the switch to a standard 19-inch rack.

Guidelines for Rackmount Installation

The installation site must be within reach of the network cabling and meet the requirements listed below:

- Appropriate grounded power receptacles must be located within 152 cm (5 feet) of the location.

- A temperature of between 5°C (41°F) and 40°C (104°F) must be maintained at the installation site with fluctuations of less than 10°C (18°F) per hour.

Caution: To ensure proper ventilation and prevent overheating, leave a minimum clearance space of 5.1 cm (2.0 in.) at the left, right, and rear of the switch.

Precaución: Para asegurar una buena ventilación y evitar que el sistema sesobrecaliente, deje un espacio mínimo de 5.1 cm (2 pulgadas) con respecto a los lados y a la parte posterior del aparato.

Warning: Before installing the chassis into a rack, ensure that the rack can support the device(s) without compromising the stability of the rack. Otherwise, personal injury and/or equipment damage may result.

Advertencia: Antes de instalar el chassis en un rack, asegurarse que el rack puede soportar el(los) dispositivo(s) sin comprometer la estabilidad del mismo. De otra forma puede suceder algun tipo de daño personal o del equipo.

Warnhinweis: Schützen Sie sich vor Verletzungen und Geräteschaden, überzeugen Sie sich vor der Installation des Chassis in das Rack, von dessen Stabilität.

Attaching Brackets and Installing in Rack

Proceed as follows to install the switch into a 19-inch rack:

1. Attach the rackmount brackets to the switch, as shown in Figure 3-5, using the eight M3 x 6 mm flathead screws shipped with the switch.

Figure 3-5   Attaching the Rackmount Brackets

| **1** | Rackmount brackets | **2** | M3 x 6 mm flathead screws |

2. With the mounting brackets attached, position the switch between the vertical frame members of the 19-inch rack as shown in Figure 3-6. Then fasten the switch securely to the frame using four mounting screws (user supplied).

Figure 3-6   Fastening the Switch to the Rack
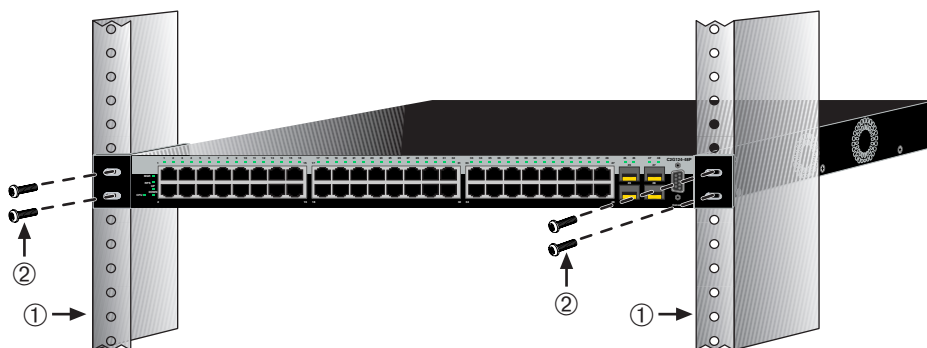
| **1** | Rails of 19-inch rack | **2** | Mounting screws (supplied by user) |

3. If you are installing this switch in a stacked configuration, repeat this procedure for each switch until all switches have been installed in the stack, then proceed to "Connecting High-Speed Stacking Cables" on page 3-10. Otherwise, proceed to "Connecting AC and PoE Power" on page 3-15.

Connecting High-Speed Stacking Cables

The stack of switches can be connected in a ring or daisy chain topology. In a ring topology all the switches are connected. The only difference in the cable connections in a daisy chain topology is that one cable is not installed.

Up to 8 switches can be stacked together using C2CAB-SHORT and C2CAB-LONG high-speed stacking cables. You can add switches and reach up to a maximum of 384 Ethernet ports per stack. The high-speed stacking cables allow the entire stack to operate with a single IP address.

Note: The high-speed stacking cables are optional items and must be ordered separately. There are two types of cables:

- C2CAB-SHORT cable to connect two adjacent switches in the stack.
- C2CAB-LONG cable to connect from the top switch to the bottom switch in the stack. You only need one C2CAB-LONG cable per stack.
- If the stack is in a configuration where the adjacent switches are two far apart for the short cables, the long cable can be used for the connections.

Figure 3-7 shows an example of a four-high stack connected in a ring topology. All STACK DOWN and STACK UP connectors used in the installation. The high-speed stacking cable **(1)** connections are from the STACK DOWN connector **(2)** of one switch to the STACK UP **(3)** connector of the next switch up in the stack. A high-speed stacking cable connection from the STACK DOWN **(4)** connector of the switch at the top of the stack to the STACK UP **(5)** connector at the bottom of the stack completes the ring connection. In a daisy chain topology, one cable is not used.

Figure 3-7   High-Speed Stacking Cable Connections
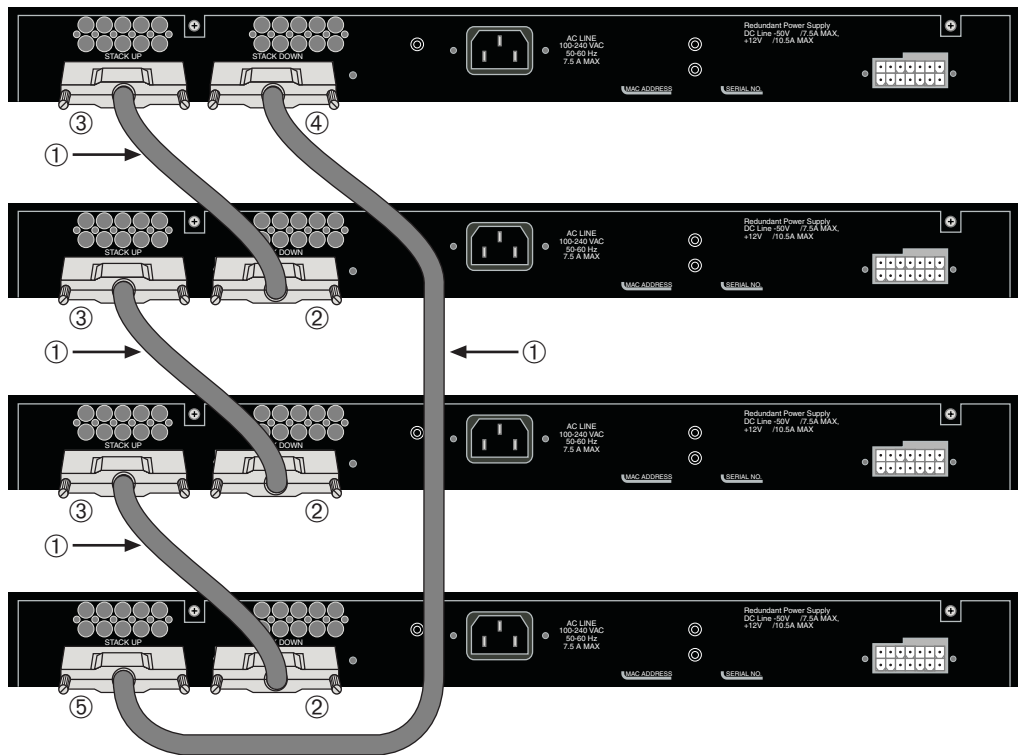
1	High-speed stacking cable	**4**	STACK DOWN connector at top of stack
2	STACK DOWN connector	**5**	STACK UP connector at bottom of stack
3	STACK UP connector		

After connecting the cables to the stacking ports, proceed to "Connecting AC and PoE Power" on page 3-15 for instructions.

Configuring Switches in a Stack

The information in the following sections is important to understand C2 switch operation and installations in a stack installation.

About SecureStack C2 Switch Operation in a Stack

The SecureStack C2 products are stackable switches that can be adapted and scaled to help meet your network needs. These switches provide a management platform and uplink to a network backbone for a stacked group of up to eight C2 switches.

Once installed in a stack, the switches behave and perform as a single switch. As such, you can start with a single switch and add more switches as your network expands. You can also mix different products in the family in a single stack to provide a desired combination of port types and functions to match the requirements of individual applications. In all cases, a stack of switches performs as one large product, and is managed as a single network entity.

When switches are installed and connected as described back in "Connecting High-Speed Stacking Cables" on page 3-10, the following occurs during initialization:

- The switch that will manage the stack is automatically established and is referred to as the Manager switch.

- All other switches are established as Member switches in the stack.

- The hierarchy of the switches that will assume the function of backup manager is also determined in case the current manager malfunctions, is powered down, or is disconnected from the stack.

- The console port on the manager switch remains active for out-of-band (local) switch management, but the console port on each member switch is deactivated. This enables you to set the IP address and system password using a single console port. Now each switch can be configured locally using only the manager's console port, or inband using a remote device and the CLI set of commands described in this section. For procedures used for various types of connections to the Console port, refer to "Connecting to Console Port for Local Management" on page 3-17.

Once a stack is created (more than one switch is interconnected), the following occurs:

1. Switch (unit) IDs are arbitrarily assigned on a first-come, first-serve basis.

2. Switch IDs are saved against each module. Then, every time a board is power-cycled, it will initialize with the same switch ID. This is important for port-specific information (for example: ge.4.12 is the 12th Gigabit Ethernet port on switch # 4).

3. The management election process uses the following precedence to assign a management device:

   a. Previously assigned / elected management switch

   b. Management assigned priority (values 1-15)

   c. Hardware preference level

   d. Highest MAC Address

Recommended Procedures to Install New and Existing Stacks

Important

The following procedures assume that all switches have a clean configuration from manufacturing. When adding a new switch to an already running stack, it is also assumed that the new switch is using the same firmware image version as other switches in the stack.

Installing a New Stackable System of Up to Eight Switches

Use the following procedure to install a new stack of up to eight switches out of the box. Before applying power, make **all** physical connections with the stack cables as described in "Connecting High-Speed Stacking Cables" on page 3-10.

1. Once all of the stack cables have been connected, individually power on each switch from top to bottom (connecting power to a switch is described in "Connecting AC and PoE Power" on page 3-15).

   If the switches are powered on almost simultaneously, the system will automatically select the first one that powers up as the Master switch and the others as Member switches. The switches are assigned unit IDs in the order that they become fully operational.

   You can control the unit ID assignment according to the physical position in a stack. When you power up each switch and allow it to become fully operational before applying power to the next switch, the first one becomes the Manager and all the next switches will join that stack (regardless of Priority, Firmware Revision, or MAC Address). The switches are assigned unit IDs in the order that you power on each switch.

   Note: Once switch IDs are assigned, they are persistent and will be retained during a power cycle to any or all of the switches.

2. (Optional) If desired, change the management switch using the **set switch movemanagement** command as described in the *SecureStack C2 Configuration Guide*.

3. Once the desired master switch has been selected, reset the system using the **reset** command as described in the *SecureStack C2 Configuration Guide*.

Adding a New Switch to an Existing Stack

Use the following procedure to install a new switch to an existing stack configuration. This procedure assumes that the new switch being added has a clean configuration from manufacturing and is running the same firmware image version as other switches in the stack.

1. Ensure that power is off on the new switch being installed.

2. Use one of the following methods to complete the stack cable connections:

   – If the running stack uses a daisy chain topology, make the stack cable connections from the bottom of the stack to the new switch (that is, STACK DOWN port from the bottom switch of the running stack to the STACK UP port on the new switch).

   – If the running stack uses a ring stack topology, break the ring and make the stack cable connections to the new switch to close the ring.

3. Apply power to the new switch.

Important Considerations About Using Clear Config in a Stack

When using the **clear config** command (as described in the *SecureStack C2 Configuration Guide*) to clear configuration parameters in a stack, it is important to remember the following:

• Use **clear config** to clear config parameters without clearing stack switch IDs. This command WILL NOT clear stack parameters and avoids the process of re-numbering the stack.

• Use **clear config all** when it is necessary to clear all config parameters, including stack switch IDs and switch priority values.

Connecting AC and PoE Power

AC Power

Note: The power supply in the switch has automatic voltage sensing that allows connection to power sources ranging from 100 to 240 VAC.

To connect the switch to the power source, refer to Figure 3-8 and proceed as follows:

1. Plug the power cord into the switch AC power connector.

2. Plug the other end of the power cord into a dedicated grounded AC outlet (not shown). The type of power outlet and power cord are country dependent.

Note: If you plan to connect all the switches quickly to allow automatic Manager selection, wait until all switches are fully operational before proceeding to the next step.

If you plan to power up each switch and allow it to become fully operational before applying power to the next switch, proceed to the next step.

Figure 3-8   Switch Rear View
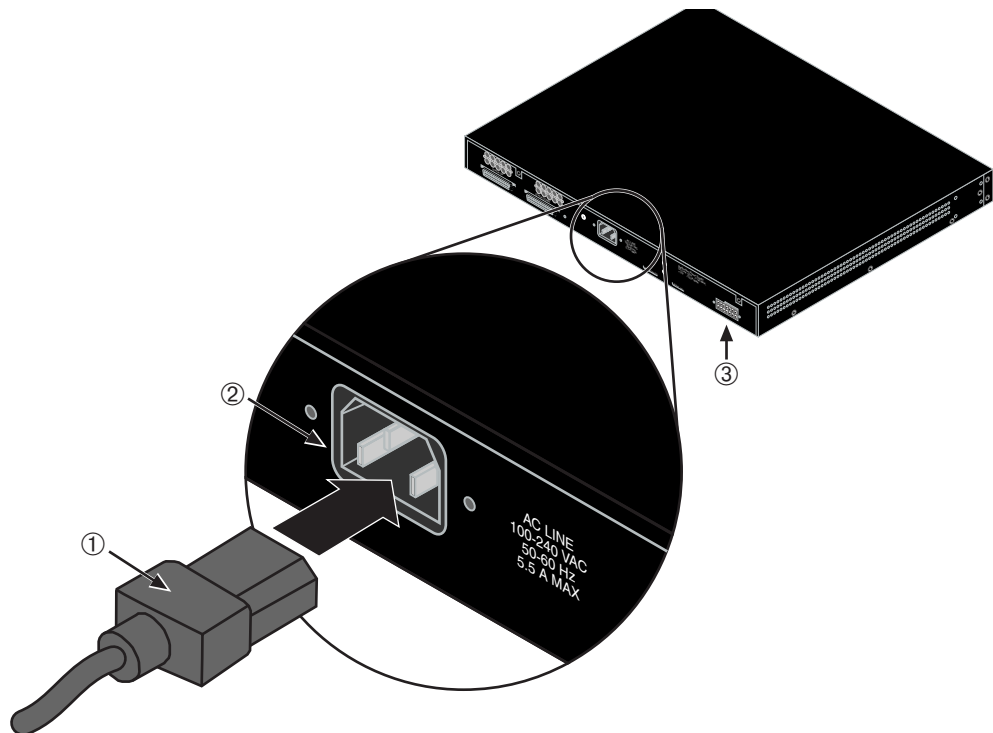
1 AC power cord   **2** AC power connector   **3** Connector for external redundant power supply

3. Observe the power CPU LED (not shown) located on the front panel. During the initialization, the CPU LED will start by illuminating solid amber, then start blinking green, then blinking amber, then blinking green again until the end of the initialization, and then turns solid green.

Note: If the CPU LED illuminates solid red, there was a critical failure. For more information about the LED indications and troubleshooting, refer to Chapter 4. If you need additional help, contact Enterasys Networks. Refer to "Getting Help" on page 1-7 for details.

If the switch is a standalone unit, it will take approximately 30 seconds for the switch to start up. If the switch is a stack Manager, it can take up to 3 minutes or more to start up, depending on the number of Member switches in the stack.

PoE Power

If you are installing an optional SecureStack C2 PoE redundant power supply (C2RPS-POE), refer to the installation instructions supplied with the C2RPS-POE. The switch is connected to a C2RPS-POE using a C2RPS-POE Cable.

Caution: The C2G124-48P and C2H124-48P **are** PoE-compliant devices. **Do not** connect a SecureStack C2 Redundant Power System (C2RPS-SYS) to the power connector. Otherwise damage to the device may result.

Precaución: Los dispositivos C2G124-48P y C2H124-48P **cumplen** con el estándar PoE (power over ethernet). **No conecte** una fuente de poder redundante SecureStack C2 (C2RPS-SYS) al cable de corriente. De lo contrario, el dispositivo puede dañarse.

If you are installing the switch as a standalone device, proceed to "Connecting to Console Port for Local Management" on page 3-17. If you are installing switches in a stack configuration, proceed to "Stack Initialization Overview" on page 3-16.

Stack Initialization Overview

When you install and connect all the high-speed stacking cables to the switches in the stack before applying power to the switches, the following occurs:

• The switch that will manage (Manager) the stack is automatically established with all other switches established as Member switches in the stack. When the switches complete their initializations, one of the switches in the stack will illuminate its Manager LED, indicating that it is the stack Manager. The Manager LED on each Member switch will be off.

• The hierarchy of the switches that will function as backup Manager is also determined in case the current Manager malfunctions, is powered down, or is disconnected from the stack.

• The Console port on each Member switch is deactivated. Only the Console port on the Manager switch is active for out-of band configuration to set the IP address, password and other configuration settings.

Once you know which switch is the Manager, proceed to "Connecting to Console Port for Local Management" on page 3-17.

Connecting to Console Port for Local Management

This section describes how to install an RS232 DTE interface cable to a PC, a VT series terminal, or a modem to an Enterasys C2G124-48P or C2H124-48P for out-of-band sessions using CLI commands.

> **Note:** When switches are connected in a stack configuration and all high-speed stacking cables are connected before powering up the switches, one switch in the stack will be automatically designated as the Manager of the stack and its Console port will remain active. All other switches will become Member switches and their Console ports will be deactivated.

What Is Needed

The following is a list of user-supplied DTE interface cables that may be needed to connect the DB9 male Console port connector on the switch. The cables are terminated by a DB9 female connector at one end, and by one of three type connectors at the other end, depending on the type connection needed for the remote device. The cables that may be needed are as follows:

• DB9 female-to-DB9 female

• DB9 female-to-DB25 female

• DB9 female-to-DB25 male

Using a DTE modem DB9 female-to-DB9 female cable, you can connect products equipped with a DB9 DTE male console port to an IBM or compatible PC running a VT series emulation software package.

Using a DTE modem DB9 female-to-DB25 female cable, you can connect products equipped with a DB9 DTE male console port to a VT series terminal or VT type terminals running emulation programs for the VT series.

Using a DTE modem DB9 female-to-DB25 male cable, you can connect products equipped with a DB9 DTE male console port to a Hayes compatible modem that supports 9600 baud.

The cable used must connect the Console port Received Data, Pin 2 to the Transmitted Data pin at the other end of the cable. The connection from the Console port Transmitted Data, Pin 3 (must be connected) to the Received Data pin cable connection at the other end of the cable. The DB9 Console port pin assignments are shown in Figure 3-9.

Figure 3-9   DB9 Male Console Port Pinout Assignments
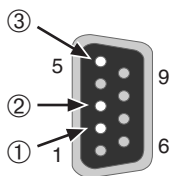
1 Pin 2, Received Data (input)
2 Pin 3, Transmitted Data (output)
3 Pin 5, Signal Ground
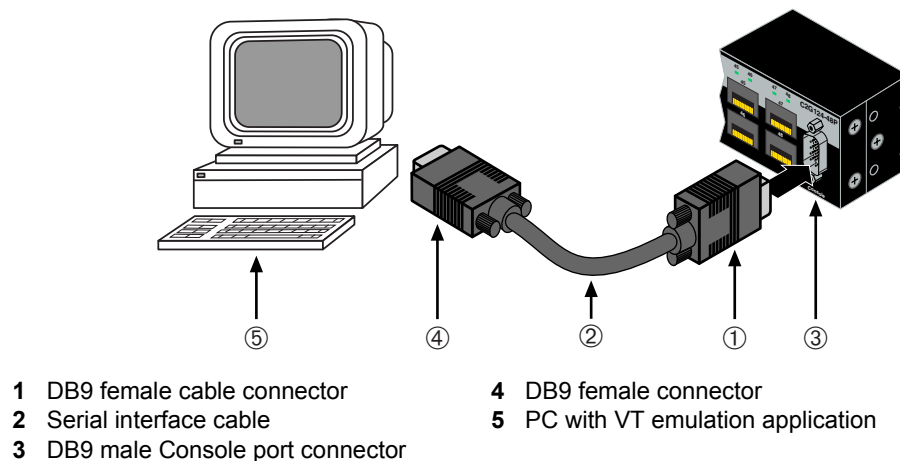   All other pins not connected.

Connecting to an IBM or Compatible Device

To connect an IBM PC or compatible device, running the VT terminal emulation, to an Enterasys switch Console port (Figure 3-10), proceed as follows:

1. Connect the DB9 female connector at one end of the cable (not supplied) to the Console port on the Enterasys switch. (If there is a switch designated as the Manager, connect to its Console port.)

2. Plug the DB9 female connector at the other end of cable into the communications port on the PC.

3. Turn on the PC and configure your VT emulation package with the following parameters:

Parameter	Setting
Mode	7 Bit Control
Transmit	Transmit=9600
Bits Parity	8 Bits, No Parity
Stop Bit	1 Stop Bit

When these parameters are set, the Startup screen will display. Proceed to "Connecting to the Network" on page 3-21.

Figure 3-10   Connecting an IBM PC or Compatible

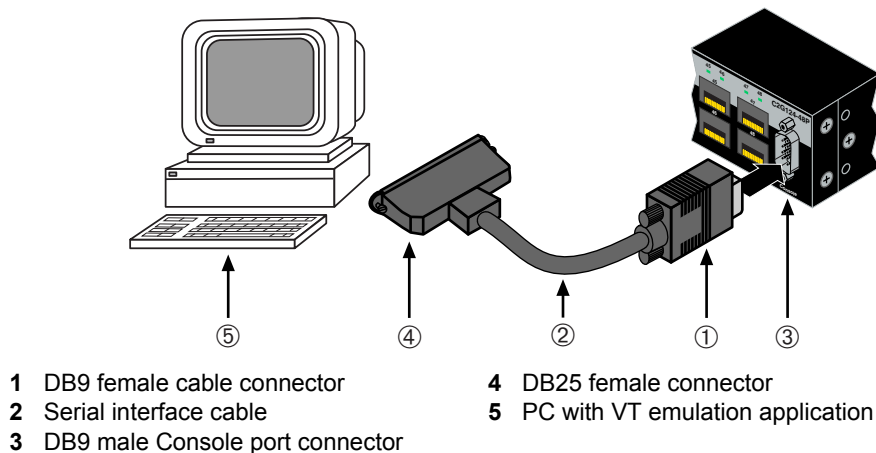|			
1	DB9 female cable connector	**4**	DB9 female connector
2	Serial interface cable	**5**	PC with VT emulation application
3	DB9 male Console port connector		

Connecting to a VT Series Terminal

To connect a VT Series terminal to an Enterasys switch Console port (Figure 3-11), use a UTP serial interface cable terminated with a DB9 female connector and a DB25 female connector and proceed as follows:

1. Connect the DB9 female connector at one end of cable to the Console port on the Enterasys switch. (If there is a switch designated as the Manager, connect to its Console port.)

2. Plug the DB25 female connector at the other end of the cable into the port labeled COMM on the VT terminal.

3. Turn on the terminal and access the Setup Directory. Set the following parameters on your terminal:

Parameter	Setting
Mode	7 Bit Control
Transmit	Transmit=9600
Bits Parity	8 Bits, No Parity
Stop Bit	1 Stop Bit

When these parameters are set, the Startup screen will display. Proceed to "Connecting to the Network" on page 3-21.

Figure 3-11   Connecting a VT Series Terminal

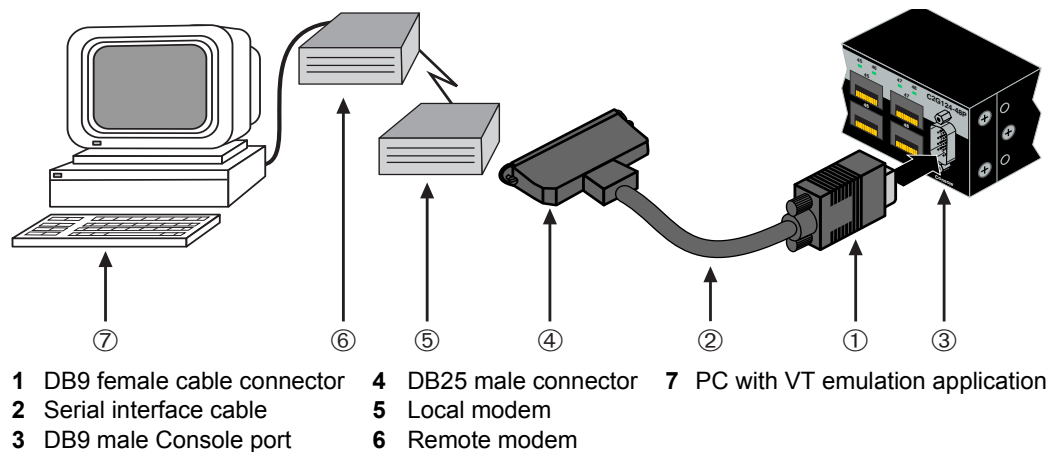|			
1	DB9 female cable connector	**4**	DB25 female connector
2	Serial interface cable	**5**	PC with VT emulation application
3	DB9 male Console port connector		

Connecting to a Modem

To connect a modem to an Enterasys Networks switch modem port (Figure 3-12), use a UTP cable terminated with a DB9 female connector and a DB25 male connector, and proceed as follows:

1. Connect the DB9 female connector at one end of the cable to the Console port on the Enterasys switch. (If there is a switch designated as the Manager, connect to its Console port.)

2. Plug the DB25 male connector at the other end of the cable into the modem communications port.

3. Turn on the modem and make sure the remote modem is ON.

4. With your PC connected to the remote modem, configure your VT emulation package with the following parameters:

Parameter	Setting
Mode	7 Bit Control
Transmit	Transmit=9600
Bits Parity	8 Bits, No Parity
Stop Bit	1 Stop Bit

When these parameters are set, the Startup screen will display. If the switches are in a stacked configuration, proceed to "Connecting to the Network" on page 3-21.

Figure 3-12   Connecting to a Modem

1	DB9 female cable connector	4	DB25 male connector	7	PC with VT emulation application
2	Serial interface cable	5	Local modem		
3	DB9 male Console port	6	Remote modem		

Connecting to the Network

The following procedures cover the cable connections from the network or other devices to the switch RJ45 ports or any installed optional Mini-GBIC.

- Connecting UTP Cables on page 3-21
- Connecting Fiber-Optic Cables to MT-RJ Ports on page 3-25
- Connecting Fiber-Optic Cables to LC Ports on page 3-27

Connecting UTP Cables

The fixed RJ45 front panel ports are 10/100/1000 Mbps ports and have internal crossovers. When connecting a workstation to these ports, use a straight-through cable. When connecting networking devices to these ports, such as a bridge, repeater, or router, use a crossover cable.

> **Note:** All fixed RJ45 front panel ports support Category 5 Unshielded Twisted Pair (UTP) cabling with an impedance between 85 and 111 ohms. Category 3 cable may be used if the connection is going to be used only for 10 Mbps.

To connect twisted pair segments to the switch, refer to Figure 3-13 and proceed as follows:

1. Ensure that the device to be connected at the other end of the segment is powered ON.

2. Connect the twisted pair segment to the switch by inserting the RJ45 connector on the twisted pair segment into the desired RJ45 port (for example, Port 8).

Figure 3-13   Connecting a UTP Cable Segment to RJ45 port
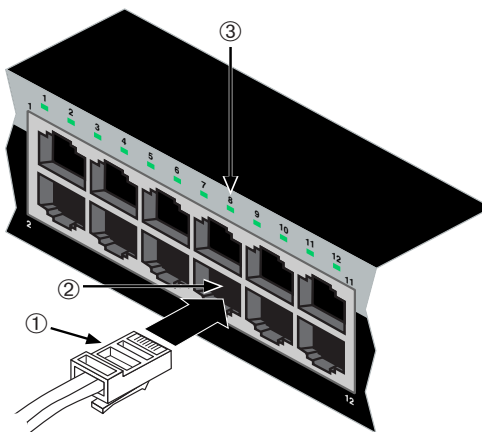
1 RJ45 connector	**2** Port 8	**3** Port 8 Link/Activity LED

3. Verify that a link exists by checking that the Link/Activity LED is ON (solid green or blinking green)

> **Note:** If the cable is connected to one of the PoE RJ45 front panel ports, solid green or blinking green also indicates that PoE power is okay. If the LED is solid amber or blinking amber PoE power failed. For more details, refer to Chapter 4.

4. If the Link/Activity LED is OFF, perform the following steps until it is on:

   a. Verify that the cabling being used is Category 5 or better with an impedance between 85 and 111 ohms with a maximum length of 100 meters (328 feet).

   b. Verify that the device at the other end of the twisted pair segment is on and properly connected to the segment.

   c. Verify that the RJ45 connectors on the twisted pair segment have the proper pinouts and check the cable for continuity. Typically, a crossover cable is used between hub devices. A straight-through cable is used to connect between switches or hub devices and an end user (computer). Refer to Figure 3-14 and Figure 3-15 for four-wire RJ45 connections. Refer to Figure 3-16 and Figure 3-17 for eight-wire RJ45 connections.

    d. Ensure that the twisted pair connection meets the dB loss and cable specifications outlined in the *Cabling Guide.* Refer to "Related Documents" on page xvi for information on obtaining this document.

5. If a link is not established or there is no PoE power, contact Enterasys Networks. Refer to "Getting Help" on page 1-7 for details.
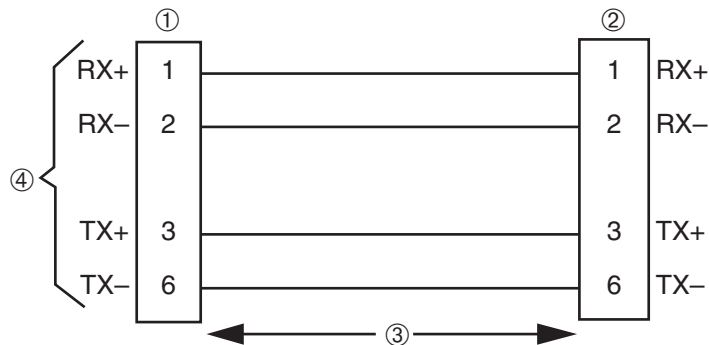
Repeat all steps above until all connections have been made.

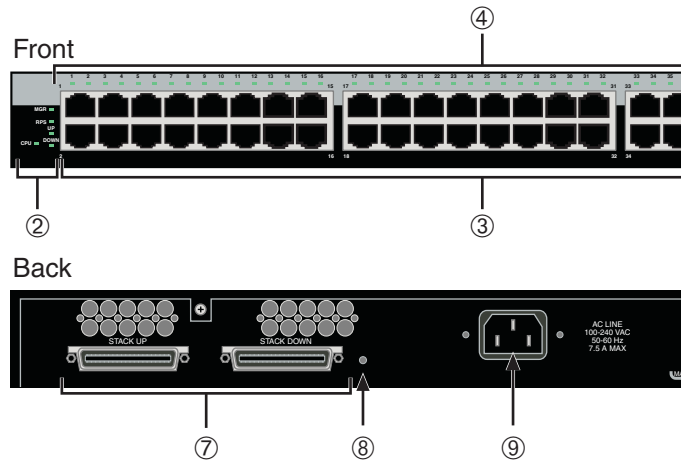**Figure 3-14   Four-Wire Crossover Cable RJ45 Pinouts for 10/100BASE-TX**

1 RJ45 switch port	**3** RJ45-to-RJ45 crossover cable
2 Other device port	**4** RX+/RX- and TX+/TX-connections
	These connections must share a common color pair.

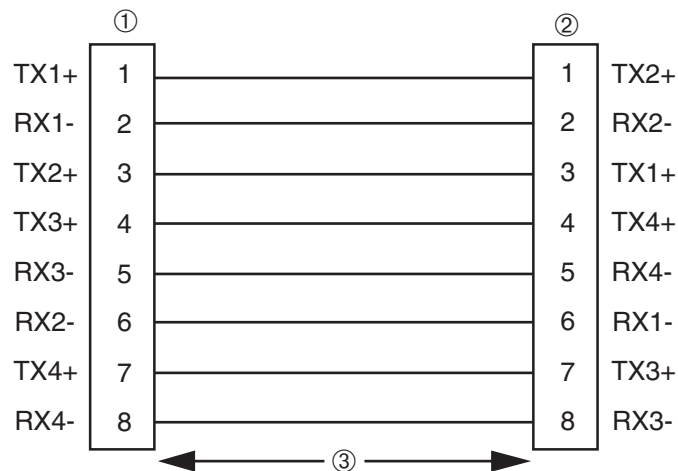**Figure 3-15   Four-Wire Straight-Through Cable RJ45 Pinouts for 10/100BASE-TX**

1 RJ45 switch port	**3** RJ45-to-RJ45 straight-through cable
2 Other device port	**4** RX+/RX- and TX+/TX-connections
	These connections must share a common color pair.

Figure 3-16   Eight-Wire Crossover Cable RJ45 Pinouts for 10/100/1000BASE-TX

1 RJ45 device port   **3** RJ45-to-RJ45 crossover cable
2 Other device port

Figure 3-17   Eight-Wire Straight-Through Cable RJ45 Pinouts for 10/100/ 1000BASE-TX

①			②
TX1+	1 — 1	TX2+
RX1-	2 — 2	RX2-
TX2+	3 — 3	TX1+
TX3+	4 — 4	TX4+
RX3-	5 — 5	RX4-
RX2-	6 — 6	RX1-
TX4+	7 — 7	TX3+
RX4-	8 — 8	RX3-

③ RJ45-to-RJ45 straight-through cable

1 RJ45 device port   **3** RJ45-to-RJ45 straight-through cable
2 Other device port

Connecting Fiber-Optic Cables to MT-RJ Ports

Warning: Do not use optical instruments to view laser output. The use of optical instruments to view laser output increases eye hazard.

Advertencia: No utilizar instrumentos opticos para ver el laser. El uso de instrumentos opticos para ver el laser incrementa el riesgo de perdida de la vision.

Warnhinweis: Benutzen sie keinesfalls optische Hilfmittel, um die Funktion des Lasers zu überprüfen, es könnte ihr Augenlicht gefährden.

This section contains the procedures for connecting a 1000BASE-SX multimode fiber-optic segment from the network or other devices to an MT-RJ port connector in a Mini-GBIC (MGBIC-MT01).

Each fiber-optic link consists of two fiber-optic strands within the cable:

- Transmit (TX)
- Receive (RX)

The transmit strand from a device port connects to the receive port of a fiber-optic Gigabit Ethernet device at the other end of the segment. The receive strand of the applicable MT-RJ port connects to the transmit port of the fiber-optic Gigabit Ethernet device.

Enterasys Networks recommends labeling fiber-optic cables to indicate receive and transmit ends. Many cables are pre-labeled, providing matching labels or tapes at both ends of each strand of cable.

To connect an MT-RJ cable to a fixed MT-RJ connector of a Mini-GBIC, refer to Figure 3-18 and proceed as follows:

1. Remove the protective covers (not shown) from the front panel MT-RJ fiber-optic port (port 21 in this example) and from the connectors on each end of the cable.

Note: Leave the protective covers in place when the connectors are not in use to prevent contamination.

⚠️ **Caution:** Do not touch the ends of the fiber-optic strands, and do not let the ends come in contact with dust, dirt, or other contaminants. Contamination of cable ends causes problems in data transmissions. If the ends of the fiber-optic strands become contaminated, use a canned duster to blow the surfaces clean. A fiber-port cleaning swab saturated with optical-grade isopropyl alcohol may also be used to clean the ends.

Precaución: No toque los extremos de los cables de fibra óptica y evite su contacto con el polvo, la suciedad o con cualquier otro contaminante. Si los extremos de los cables se ensucian, es posible que la transmisión de datos se vea afectada. Si nota que losextremos de los cables de fibra óptica se ensucian, utilice aire comprimido paralimpiarlos. También puede limpiarlos con un estropajo embebido en alcohol isopropílico.

2. Insert the MT-RJ cable connector into the MT-RJ connector until it clicks into place.

Note: To remove the MT-RJ cable connector, press on its release tab and pull out the cable connector.

Figure 3-18   Cable Connection to MT-RJ Multimode Fiber-Optic Connectors
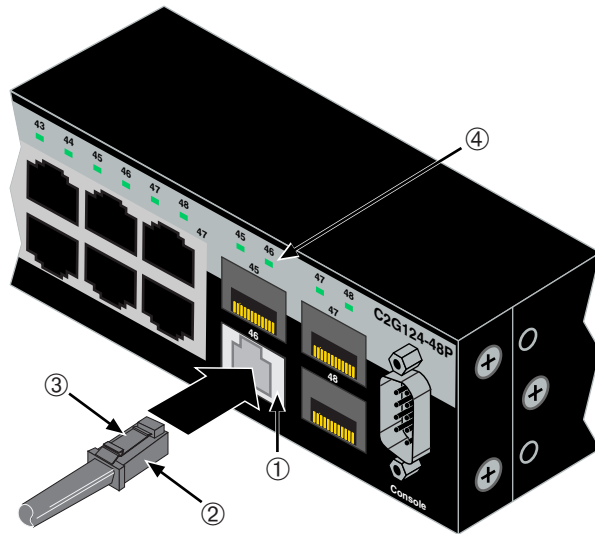
| **1** | Mini-GBIC MT-RJ port connector | **3** | Release tab |
| **2** | MT-RJ cable connector | **4** | Link/Activity LED |

3. Plug the other end of the cable into the appropriate port on the other device. Some cables may be terminated at the other end with two separate connectors, one for each fiber-optic strand. In this case, ensure that the transmit fiber-optic strand is connected to the receive port and the receive fiber-optic strand to the transmit port.

4. Verify that a link exists by checking that the port Link/Activity LED is on (blinking green or solid green). If the Link/Activity LED is off, perform the following steps until it is on:

   a. Verify that the device at the other end of the segment is ON and connected to the segment.

   b. If there are separate fiber-optic connections on the other device, check the crossover of the cables. Swap the cable connections if necessary.

   c. Check that the fiber-optic connection meets the dB loss and cable specifications outlined in the Cabling Guide for multimode cabling. To obtain this document, refer to "Related Documents" on page xvi.

   If a link has not been established, refer to Chapter 4 for LED troubleshooting details. If a problem persists, refer to "Getting Help" on page 1-7 for details on contacting Enterasys Networks for support.

5. Repeat steps 1 through 4, above, until all connections have been made.

Connecting Fiber-Optic Cables to LC Ports

⚠ **Warning:** Do not use optical instruments to view laser output. The use of optical instruments to view laser output increases eye hazard.

Advertencia: No utilizar instrumentos opticos para ver el laser. El uso de instrumentos opticos para ver el laser incrementa el riesgo de perdida de la vision.

Warnhinweis: Benutzen sie keinesfalls optische Hilfmittel, um die Funktion des Lasers zu überprüfen, es könnte ihr Augenlicht gefährden.

This section describes how to connect

• a 1000BASE-SX multimode fiber-optic segment from the network or other devices to an LC port connector of a Mini-GBIC (MGBIC-LC01 or MGBIC-LC03), or

• a 1000BASE-LX single-mode fiber-optic segment from the network or other devices to an LC port connector of a Mini-GBIC (MGBIC-LC09).

Each fiber-optic link consists of two fiber-optic strands within the cable:

• Transmit (TX)

• Receive (RX)

The transmit strand from a device port connects to the receive port of a fiber-optic Gigabit Ethernet device at the other end of the segment. The receive strand of the applicable LC port connects to the transmit port of the fiber-optic Gigabit Ethernet device.

Enterasys recommends labeling fiber-optic cables to indicate receive and transmit ends. Many cables are pre-labeled, providing matching labels or tapes at both ends of each strand of cable.

To connect an LC cable connector to a fixed LC connector of a Mini-GBIC, refer to Figure 3-19 and proceed as follows:

1. Remove the protective covers (not shown) from the front panel LC fiber-optic port (port 22 in this example) and from the connectors on each end of the cable.

Note: Leave the protective covers in place when the connectors are not in use to prevent contamination.

Caution: Do not touch the ends of the fiber-optic strands, and do not let the ends come in contact with dust, dirt, or other contaminants. Contamination of cable ends causes problems in data transmissions. If the ends of the fiber-optic strands become contaminated, use a canned duster to blow the surfaces clean. A fiber-port cleaning swab saturated with optical-grade isopropyl alcohol may also be used to clean the ends.

Precaución: No toque los extremos de los cables de fibra óptica y evite su contacto con el polvo, la suciedad o con cualquier otro contaminante. Si los extremos de los cables se ensucian, es posible que la transmisión de datos se vea afectada. Si nota que losextremos de los cables de fibra óptica se ensucian, utilice aire comprimido paralimpiarlos. También puede limpiarlos con un estropajo embebido en alcohol isopropílico.

2. Insert the LC cable connector into the Mini-GBIC LC connector until it clicks into place.

Note: To remove the LC cable connector, press on its release tab and pull it out of Mini-GBIC LC connector.

Figure 3-19   Cable Connection to LC Fiber-Optic Connectors
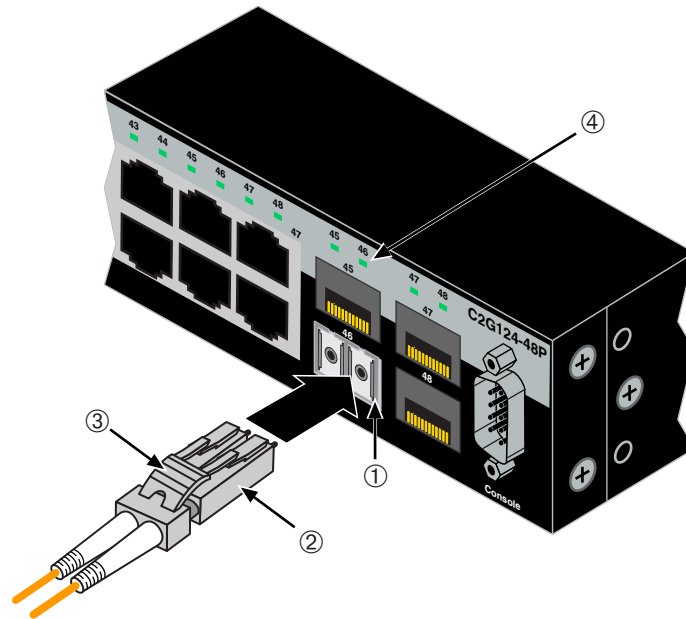
1	Mini-GBIC MT-RJ port connector	**3**	Release tab
2	LC cable connector	**4**	Link/Activity LED

3. Plug the other end of the cable into the appropriate port on the other device. Some cables may be terminated at the other end with two separate connectors, one for each fiber-optic strand. In this case, ensure that the transmit fiber-optic strand is connected to the receive port and the receive fiber-optic strand to the transmit port.

4. Verify that a link exists by checking that the port Link/Activity LED is on (blinking green or solid green). If the Link/Activity LED is off, perform the following steps until it is on:

   a. Verify that the device at the other end of the segment is ON and connected to the segment.

   b. If there are separate fiber-optic connections on the other device, check the crossover of the cables. Swap the cable connections if necessary.

   c. Check that the fiber-optic connection meets the dB loss and cable specifications outlined in the Cabling Guide for multimode mode cabling. To obtain this document, refer to "Related Documents" on page xvi.

   d. If a link has not been established, refer to Chapter 4 for LED troubleshooting details. If a problem persists, refer to "Getting Help" on page 1-7 for details on contacting Enterasys Networks for support.

5. Repeat steps 1 through 4, above, until all connections have been made.

Completing the Installation

After installing the switch and making the connections to the network, access the switch management, as described below.

Initial Logon to Switch Management

To initially access switch management from your local PC, terminal, or modem connection, proceed as follows at the displayed startup screen:

1. Enter **rw** (Read-Write) for Username.

2. At the Password prompt, press **ENTER** (RETURN).

3. For details on how to configure the switch using the command line interface, refer to the *SecureStack C2 Configuration Guide*. The CLI commands enable you to set a new password and perform more involved management configurations on the switch. One of many capabilities is to reconfigure the stack, reassigning the Manager function to another switch and configuring the order of Member switches that will take over the stack management functions in case the operating Manager is powered down, malfunctions, or is removed from the stack.

4. After the initial configuration, you can also use WebView (Enterasys Networks' embedded web server) for configuration and management tasks.

   All the guides associated with the switch are available online at:
   http://www.enterasys.com/support/manuals

Once you are confident that the installation is successful, route and secure your cables. If you require assistance, contact Enterasys Networks using one of the methods described in "Getting Help" on page 1-7.

4

Troubleshooting

This chapter provides information concerning the following:

For information about...	Refer to page...

Using LANVIEW

The switch uses the Enterasys Networks built-in visual diagnostic and status monitoring system called LANVIEW. For the location of LANVIEW LEDs on the C2G124-48P and C2H124-48P, refer to Figure 4-1 and Figure 4-2, respectively. These LEDs allow you to quickly observe network status for diagnosing switch and network problems.

Figure 4-1   C2G124-48P LANVIEW LEDs
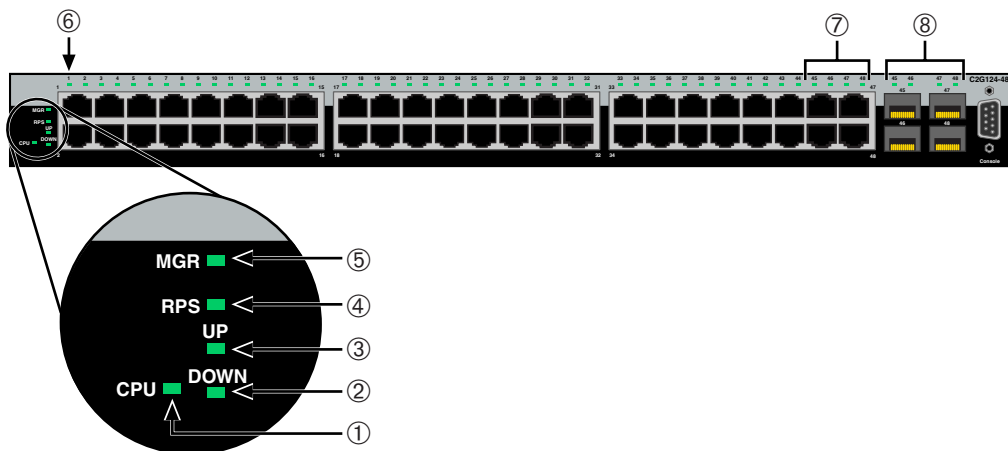
1	CPU LED	**6**	Link/Activity/PoE LED for 10/100/1000 Mbps, RJ45 port 1
2	STACK DOWN LED	**7**	Link/Activity/PoE LEDs for 10/100/1000 Mbps
3	STACK UP LED		RJ45 ports 45 through 48
4	RPS LED for redundant power source status	**8**	Link/Activity LEDs for 1-Gbps Mini-GBIC ports 49 through 52[1]
5	Manager LED		

1. These Mini-GBIC ports will only establish a link when the RJ45 port equivalent is not linked on a C2G124-48P. (For example: when Mini-GBIC port 45 is linked, RJ45 port 45 is deactivated. When Mini-GBIC is not linked, the RJ45 port 45 is reactivated and can establish a link as long as the Mini-GBIC port 45 is not linked first.)

Figure 4-2   C2H124-48P LANVIEW LEDs
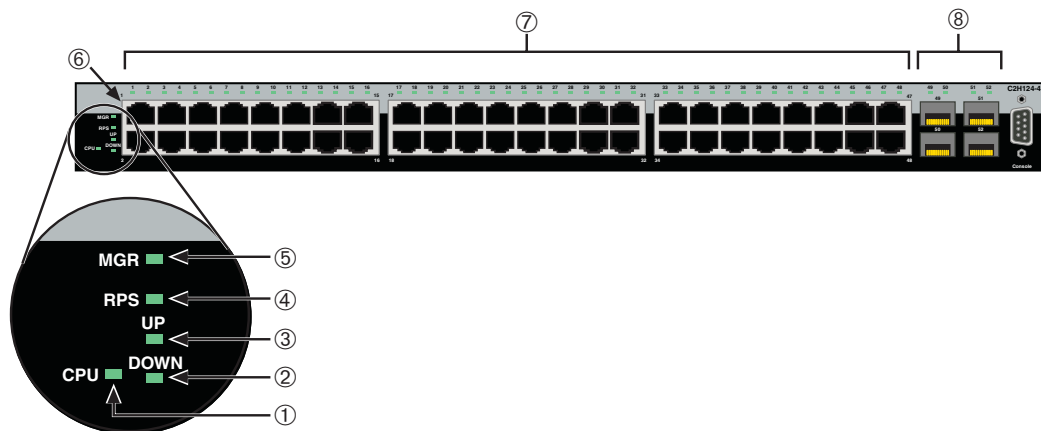
1	CPU LED	6	Link/Activity LED for 10/100 Mbps, port 1
2	STACK DOWN LED	7	Link/Activity LEDs for 10/100 Mbps, RJ45 ports 1 through 48
3	STACK UP LED		
4	RPS LED for redundant power-source status	8	Link/Activity LEDs for 1-Gbps Mini-GBIC ports 49 through 52[1]
5	Manager LED		

1. Unlike the C2G124-48P, all 52 ports may be active at the same time.

Table 4-1 describes the LED indications and provides recommended actions as appropriate.

> **Note:** The terms **flashing**, **blinking**, and **solid** used in Table 4-1 indicate the following:
>
> **Flashing:** LED is flashing randomly.
>
> **Blinking:** LED is flashing at a steady rate (approximately 50% on, 50% off).
>
> **Solid:** LED is on steady and not pulsing.

Table 4-1   LANVIEW LED Diagnostic Indications

LED	Color	State	Recommended Action
CPU	Off	Power disconnected.	If the LED remains off after connecting AC power or DC power from an RPS, check the following: 1. Make sure there is power at the power source (AC source and RPS if applicable). 2. Replace the power cord with a known good one or check the continuity of the power cord. 3. If the switch still does not power up, the system may have a fatal error. Contact Enterasys Networks for technical support.
	Red	**Solid.** Boot-up failed.	If the LED remains red for several minutes, the system may have a fatal error. Contact Enterasys Networks for technical support.
	Amber	**Solid.** Diagnostics are running.	If the LED remains amber for more than several minutes, contact Enterasys Networks for technical support.
		Blinking. Code image is being downloaded.	None.
	Green	**Solid.** System is fully functional.	None.
		Blinking. Boot-up in process.	None.
DOWN	Off	No valid connection to switch stack up connector.	1. Make sure the switch connected to the stack up connector is powered on. 2. Replace cable with a known good one. 3. If the problem still exists, contact Enterasys Networks for technical support.
	Green	**Solid.** Valid connection to switch stack up connector. **Blinking.** Information is being transferred through the high-speed stacking cable.	None.

Table 4-1   LANVIEW LED Diagnostic Indications (continued)

LED	Color	State	Recommended Action
UP	Off	No valid connection to switch stack down connector.	1. Make sure the switch connected to the stack down connector is powered on. 2. Replace cable with a known good one. 3. If the problem still exists, contact Enterasys Networks for technical support.
	Green	**Solid.** Valid connection to switch stack down connector. **Blinking.** Information is being transferred through the high-speed stacking cable.	None.
Manager	Off	Switch is operating as a Member in the stack.	None.
	Green	**Solid.** Switch is operating as the Manager of the stack.	None.
RPS	Off	RPS not in use.	None.
	Amber	**Solid.** The switch internal power supply failed, and the RPS is providing the proper power to the switch.	If an RPS is connected to the switch and should be providing power, perform the following: 1. Ensure the RPS is powered on. 2. Ensure that the AC power cord to the RPS is plugged in correctly and that there is power at the AC power source. 3. Replace the power cord with a known good one. 4. Ensure the DC power cord from the RPS to the switch is plugged in correctly. 5. If the problem persists, contact Enterasys Networks for technical support.

Table 4-1   LANVIEW LED Diagnostic Indications (continued)

LED	Color	State	Recommended Action
Link/ Activity (RJ45 PoE ports 1–48)	Off	1. No link.	None.
		2. No activity or port in standby.	None.
		3. The port is deactivated because the Mini-GBIC port with the same port number is linked.	None.
	Green	**Solid.** Port is linked, but the interface is not receiving any traffic. PoE power is okay.	None.
		Blinking. Port is linked and traffic is being received or transmitted by the interface. PoE power is okay.	None.
	Amber	**Solid.** Port is linked, but traffic is not being received or transmitted by the interface. PoE power has failed. PoE power may have been deactivated because of excessive power requirement or deactivated by configuration. Power Supply failed.	1. Check the attached powered device to see if it is defective. 2. Internal power supply failed, contact Enterasys Networks for technical support.
		Blinking. Port is linked and traffic is being received or transmitted by the interface. PoE power has failed. PoE power may have been deactivated because of excessive power requirement or deactivated by configuration. Power supply failed.	1. Check the attached powered device to see if it is defective. 2. Internal power supply failed, contact Enterasys Networks for technical support.
Link/ Activity (MGBIC ports 45–48)	Off	1. No link.	None.
		2. No activity or port in standby.	None.
		3. The port is deactivated because the RJ45 port with the same port number is linked.	None.
	Green	**Solid.** Port is linked, but the interface is not receiving any traffic.	None.
		Blinking. Port is linked and traffic is being received or transmitted by the interface.	None.

Troubleshooting Checklist

If the device is not working properly, refer to Table 4-2 for a checklist of problems, possible causes, and recommended actions to resolve the problem.

Table 4-2   Troubleshooting Checklist

Problem	Possible Cause	Recommended Action
All LEDs are OFF.	Loss of power.	Ensure that the switch was installed properly according to the installation instructions in Chapter 3.
		Ensure that the power cords are connected properly to an active power source that meets the AC input specifications for this switch.
		Ensure that the AC power cord is not damaged. Replace the power cord with a known good one.
No local management startup screen.	Incorrect terminal setup.	Refer to the *SecureStack C2 Configuration Guide* for proper setup procedures.
	Improper Console cable pinouts.	Refer to Appendix A for proper Console port pinouts.
	Corrupt firmware image, or hardware fault.	If possible, attempt to download the image to the device again. Refer to the *SecureStack C2 Configuration Guide* for details.
Cannot navigate beyond startup screen.	Improper Community Names Table.	Refer to the *SecureStack C2 Configuration Guide* for the Community Names Table setup.
Cannot contact the switch through in-band management.	IP address not assigned.	Refer to the *SecureStack C2 Configuration Guide* for the IP address assignment procedure.
	Port is disabled.	This is normal if the switch is a Member in a stack.
		If operating as a standalone switch or as the Manager in a stack, enable the port. Refer to the *SecureStack C2 Configuration Guide* for instructions to enable/disable ports.
	No link to device.	Verify that all network connections between the network management station and the device are valid and operating.
		If the problem continues, contact Enterasys Networks for technical support.

Table 4-2   Troubleshooting Checklist (continued)

Problem	Possible Cause	Recommended Action
Port(s) goes into standby for no apparent reason.	Loop condition detected.	Verify that Spanning Tree is enabled. Refer to the *SecureStack C2 Configuration Guide* for the instructions to set the type of STA.
		Review the network design and delete unnecessary loops.
		If the problem continues, contact Enterasys Networks for technical support.
User parameters (IP address, device and module name, etc.) were lost when the switch power was cycled.	Clear NVRAM was set using CLI commands.	Reenter the lost parameters as necessary. Refer to the *SecureStack C2 Configuration Guide* for the instructions to configure the switch using CLI commands.
		If the problem continues, contact Enterasys Networks for technical support.

Using the Reset Button

If you forget the switch login password, use the Reset button as described in the following procedure.

Figure 4-3   Reset Button
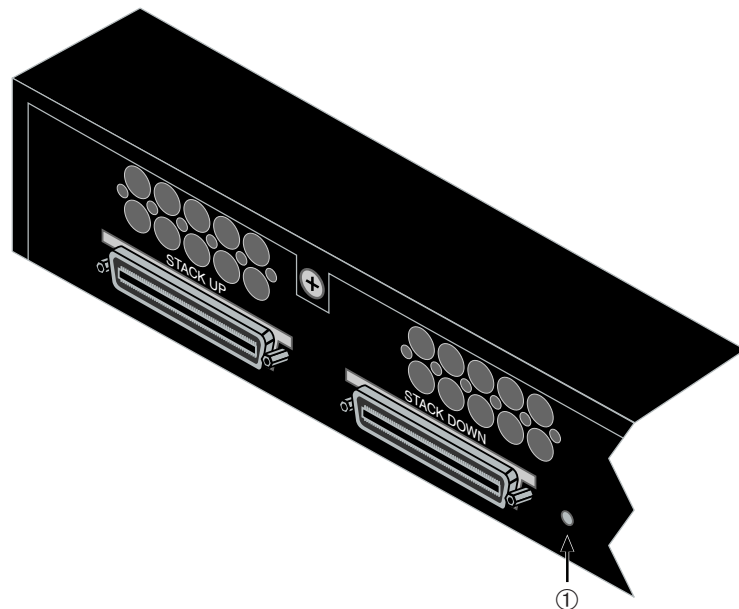
1 Reset button

To reset the switch password, refer back to Figure 4-3 and proceed as follows:

Note: Notify the system manager before changing the password.

1. Press-and-hold the Reset button while the switch is operational. This change of the login password to the default password will be indicated through CLI only.

2. Logon to device management. You can now logon to the switch through the Console port and assign a new password using the command line interface (CLI).

3. To access switch management from your local PC, terminal, or modem connection, refer to the *SecureStack C2 Configuration Guide* for instructions on how to log in and enter a new password. The guide is available at:

    http://www.enterasys.com/support/manuals

If you require assistance, contact Enterasys Networks using one of the methods described in "Getting Help" on page 1-7.

A

Specifications

This appendix provides information about the following:

For information about...	Refer to page...
C2G124-48P/C2H124-48P Switch Specifications	A-1
Mini-GBIC Input/Output Specifications	A-3
Gigabit Ethernet Specifications	A-4
Console Port Pinout Assignments	A-7
Regulatory Compliance	A-7

Enterasys Networks reserves the right to change the specifications at any time without notice.

C2G124-48P/C2H124-48P Switch Specifications

Table A-1 provides the I/O ports, processors and memory, physical, and environmental specifications for the C2G124-48P and C2H124-48P.

Table A-1   Switch Specifications

Item	Specification
C2G124-48P	
RJ45 ports 1 through 48	Forty-eight, 10BASE-T/100BASE-TX /1000BASE-T compliant ports with auto-sensing and auto-negotiation via RJ45 connectors. These ports also support 802.3af PoE connections.
SFP ports 45 through 48	Four slots that support optional Mini-GBICs for 1000BASE-T Gigabit copper and 1000BASE-FX fiber-optic connections.
	When an SFP transceiver (Mini-GBIC) that is installed in ports 45 through 48 establishes a link, the associated fixed front panel RJ45 10BASE-T/100BASE-TX /1000BASE-T port is disabled.

Table A-1   Switch Specifications (continued)

Item	Specification
C2H124-48P	
RJ45 ports 1 through 48	Forty-eight, 10BASE-T/100BASE-TX compliant ports with auto-sensing and auto-negotiation via RJ45 connectors. These ports also support 802.3af PoE connections.
SFP ports 49 through 52	Four slots that support optional Mini-GBICs for 1000BASE-T Gigabit copper and 1000BASE-FX fiber-optic connections. Unlike the C2G124-48P, all ports may be linked and operating without affecting any RJ45 ports.
Processors/Memory	
Processor	MPC8245, 400 MHz processor
Dynamic Random Access Memory (DRAM)	256 MB
FLASH Memory	32 MB
Physical	
Dimensions	4.4 H x 44.1 W x 36.85 D (cm) 1.7 H x 17.4 W x 14.5 D (in.)
Approximate Weight	
C2G124-48P	Gross: 8.19 kg (18.1 lb) (shipping carton containing one module) Net: 6.94 kg (15.3 lb) (one module without packaging)
C2H124-48P	Gross: 7.75 kg (17.1 lb) (shipping carton containing one module) Net: 6.50 kg (14.3 lb) (one module without packaging)
Predicted hours for Mean Time Between Failures (MTBF)	102,777 hours
Heat Dissipation (maximum)	
C2G124-48P	@ 489.5 W, 1,670.24 Btu/hr
C2H124-48P	@ 489.5 W, 1,670.24 Btu/hr
AC Input Specifications	
Input Voltage	100 to 240 VAC
Input Current	7.5 A Max
Frequency	50 to 60 Hz

Table A-1   Switch Specifications (continued)

Item	Specification
Redundant Power Supply Input Specifications (supports input from C2RPS-POE only)	
Dc Input Voltages	-50 Vdc
	+12 Vdc
Input Currents	7.5 A maximum at -50 Vdc
	10.5 A maximum at +12 Vdc
Environmental	
Operating Temperature	5°C to 40°C (41°F to 104°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Operating Relative Humidity	5% to 90% (non-condensing)

Mini-GBIC Input/Output Specifications

The Mini-Gigabit Ethernet Card (Mini-GBIC) port interface slots can support 1-Gbps fiber-optic and copper connections as described in Table A-2. The optional Mini-GBICs are hot swappable.

Table A-2   Mini-GBIC Input/Output Port Specifications

Item	Specification
MGBIC-LC01	Provides one LC fiber-optic multimode port that is compliant with the 1000BASE-SX standard LC connector.
MGBIC-LC03	Provides one LC fiber-optic multimode port that is compliant with the 1000BASE-SX standard LC connector.
MGBIC-LC09	Provides one LC fiber-optic single-mode port that is compliant with the 1000BASE-LX standard LC connector.
MGBIC-MT01	Provides one MT-RJ fiber-optic multi-mode port that is compliant with the 1000BASE-SX standard MT-RJ connector.
MGBIC-08	Provides one LC fiber-optic single-mode port that is compliant with the 1000BASE-ELX standard LC connector.
MGBIC-02	Provides one RJ45 copper connection that is compliant with the 1000BASE-T standard RJ45 connector.

Gigabit Ethernet Specifications

The following specifications for the Mini-GBICs shown in Table A-3 through Table A-11 meet or exceed the IEEE 802.3z-1998 standard.

MGBIC-LC01/MGBIC-MT01 Specifications (1000BASE-SX)

Table A-3   MGBIC-LC01/MGBIC-MT01 Optical Specifications

Item	62.5 μm MMF	50 μm MMF
Transmit Power (minimum)	-9.5 dBm	-9.5 dBm
Receive Sensitivity	-17 dBm	-17 dBm
Link Power Budget	7.5 dBm	7.5 dBm

Table A-4   MGBIC-LC01/MGBIC-MT01 Operating Range

Item	Modal Bandwidth @ 850 nm	Range
62.5 μm MMF	160 MHz/km	2-220 Meters
62.5 μm MMF	200 MHz/km	2-275 Meters
50 μm MMF	400 MHz/km	2-500 Meters
50 μm MMF	500 MHz/km	2-550 Meters

MGBIC-LC03 Specifications (1000BASE-LX)

Table A-5   MGBIC-LC03 Optical Specifications

Item	62.5/125 μm MMF	50/125 μm MMF
Transmit Power (minimum)	-9.5 dBm	-9.5 dBm
Transmit Power (maximum)	-3 dBM	-3 dBM
Receive Sensitivity	-20 dBm	-20 dBm
Link Power Budget[1] (Multimode Only)	10.5 dB	10.5 dB

1. The maximum drive distance (up to 2 km) depends on the quality of the installed multimode fiber-optic cable segment. Use the Link Power Budget to calculate the maximum cable length of the attached segment. The Link Power Budget must not exceed those specified in this table. The MGBIC-LC03 input power must not exceed -3 dBm. Otherwise, saturation could occur.

Table A-6   MGBIC-LC03 Operating Range

Item	Modal Bandwidth @ 1310 nm	Range
62.5 µm MMF	160 MHz/km	2,000 Meters
50 µm MMF	400 MHz/km	2,000 Meters

MGBIC-LC09 Specifications (1000BASE-LX)

Table A-7   MGBIC-LC09 Optical Specifications

Item	62.5 µm MMF	50 µm MMF	10 µm SMF
Transmit Power (minimum)	-11.5 dBm	-11.5 dBm	-9.5 dBm
Receive Sensitivity	-20 dBm	-20 dBm	-20 dBm
Link Power Budget	8.5 dBm	8.5 dBm	10.5 dBm

Table A-8   MGBIC-LC09 Operating Range

Item	Modal Bandwidth @ 1300 nm	Range
62.5 µm MMF	500 MHz/km	2-550 Meters
50 µm MMF	400 MHz/km	2-550 Meters
50 µm MMF	500 MHz/km	2-550 Meters
10 µm SMF	N/A	2-10,000 Meters

MGBIC-08 Specifications (1000BASE-ELX)

Table A-9   MGBIC-08 Optical Specifications

Item			
Transmit Power (minimum)	-0 dBm, min.	+2 dBm, typical	+5 dBm, max.
Receive Sensitivity	-24 dBm, min.	-26 dBm, typical	
Maximum Input Power	-3 dBm		
Link Power Budget[1] (Full Duplex Only)	23 dB	28 dB, typical	

1. The maximum drive distance (up to 70 km) depends on the quality of the installed single-mode fiber-optic cable segment. Use the Link Power Budget to calculate the maximum cable length of the attached segment. The Link Power Budget must not exceed those specified in this table. The MGBIC-08 input power must not exceed -3 dBm. Otherwise, saturation could occur.

Table A-10   MGBIC-08 Operating Range

Item	1550 nm	Range
9 or 10 µm SMF	N/A	70,000 Meters

MGBIC-02 Specifications (1000BASE-T)

Table A-11   MGBIC-02 Specifications

Item	Specification
Supported Cable: Type Maximum Length	 Copper, Category 5 UTP Up to 100 meters
Connector	RJ45
Data Rate	1 Gbps, IEEE 802.3:2000 compatible 1000BASE-T operation only Automatic crossover detection
TX Output impedance	100 ohms, typical at all frequencies between 1 MHz and 125 MHz
RX Input impedance	100 ohms, typical at all frequencies between 1 MHz and 125 MHz

Console Port Pinout Assignments

The Console port is a DB9 serial communications port for local access to Local Management. Refer to Figure A-1 for the Console port pin assignments.

Figure A-1   Console Port Pinout Assignments

1	Pin 2, Received Data (input)	**3**	Pin 5, Signal Ground
2	Pin 3, Transmitted Data (output)		All other pins not connected.

Regulatory Compliance

The C2G124-48P and C2H124-48P meet the safety and electromagnetic compatibility (EMC) requirements listed in Table A-12:

Table A-12   Compliance Standards

Regulatory Compliance	Standards
Safety	UL 60950, CSA C22.2 No. 60950, 73/23/EEC, EN 60950, and IEC 60950. The Mini-GBICs that support laser connections also meet the EN 60825 and 21 CFR 1040.10 standards.
Electromagnetic Compatibility (EMC)	47 CFR Parts 2 and 15, CSA C108.8, 89/336/EEC, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 55024, AS/NZS CISPR 22, and VCCI V-3.

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